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(Use Edge Index on back cover to locate subject field in the journal)

FIELD 1. AERONAUTICS. Includes the following Groups: Aerodynamics; Aeronautics; Aircraft, Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE. Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS. Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES. Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES. Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES. Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology, Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY. Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY. Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING. Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive). Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS. Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES. Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING. Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings; Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT. Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES. Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY. Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES. Includes the following Groups: Acoustic Detection, Communications, Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY. Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Nonpower); SNAP Technology.

FIELD 19. ORDNANCE. Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS. Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory; Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS. Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY. Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

Sample Entries

Report entries are arranged by COSATI group and field. Within fields they are arranged alphanumerically by Accession (Order) Number - alphabetic data precedes numeric.

AD/A-003 266/4GA PC$6.25/MF$2.25
Kansas Univ/Center for Research Inc Lawrence Remote Sensing Lab
PROJECT THEMIS: A CENTER FOR REMOTE SENSING.
Final rept. 16 Sep 67-15 Sep 73,
F.T. Ulaby, and R.K. Moore, Jun 74, 172p Rept no. CRES-TR-133-29 ETL-CR-74-10
Contract DAAK02-68-C-0089
See also AD-743 234.

Descriptors: *Radar mapping, *Target discrimination, Aerial reconnaissance, Data processing equipment, Preprocessing, Microwaves, Ultrasonic radiation, Image intensification, Backscattering, Agriculture, Vegetation, Land use, Soils, Scattering, Spectrometry.
Identifiers: Themis project, *Remote sensing.

This report summarizes the technical work accomplished under Project THEMIS, A Center for Remote Sensing at the University of Kansas during the period 16 September 1967 through 15 September 1973. The highlights of the four major areas forming the remote sensing system are presented. A detailed description of the latest radar spectrometer results is presented.

Index entries are arranged alphanumerically. Titles are included in all indexes except Contract Number Index. Sample entries for each index follow:

Subject: Entries are sequenced by major subject term, second paired term, and accession number.

RADAR MAPPING
Project THEMIS: A Center for Remote Sensing.
AD/A-003 266/4GI

Personal Author: Entries are sequenced by personal author, report title, and accession number.

MOORE, R. K.
Project THEMIS: A Center for Remote Sensing.
AD/A-003 266/4GI

Corporate Author: Entries are sequenced by corporate author name, report number, and accession number. The monitor agency number is given following the report title.

KANSAS UNIV/CENTER FOR RESEARCH INC LAWRENCE REMOTE SENSING LAB
CRES-TR-133-29
Project THEMIS: A Center for Remote Sensing.
(ETL-CR-74-10)
AD/A-003 266/4GI

Contract Grant Number: Entries are sequenced by contract or grant number, corporate author, and accession number.

DAAK02-68-C-0089
Kansas Univ/Center for Research Inc Lawrence Remote Sensing Lab
AD/A-003 266/4GI

Accession/Report Number: Entries are sequenced by accession, report, or monitor agency number. Prices are given in this index.

AD/A-003 266/4GI
Project THEMIS: A Center for Remote Sensing.
AD/A-003 266/4GI 8F PC$6.25/MF$2.25

REPORTS ANNOUNCEMENTS

1. AERONAUTICS

1A. Aerodynamics

AD-A027 184/3GA PC$4.00/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Aviation and Surface Effects Dept
Two-Dimensional Subsonic Wind Tunnel Evaluation of a 20-Percent-Thick Circulation Control Airfoil.
Final rept.,
Jane Abramson. Jun 75, 33p Rept no. DTNSRDC-ASED-331

Descriptors: *Airfoils, Two dimensional, Boundary layer control, Boundary layer flow, Ellipses, Wind tunnel tests, Wind tunnel models, Lift to drag ratio, High lift, Aerodynamic characteristics.
Identifiers: *Circulation control airfoils, Elliptic airfoils, Tangential blowing.

A circulation control uncambered elliptic airfoil section with a thickness-to-chord ratio of 0.20 was tested subsonically to determine its aerodynamic characteristics. Lift coefficients up to 5 were produced at momentum coefficients, of 0.24. The initially high unblown drag coefficients, characteristic of bluff trailing edge airfoils, were greatly reduced at low values of momentum coefficient. It was therefore possible to produce equivalent lift-to-drag ratios in excess of 30 when Cl = 1.0. The ability to produce high lift coefficients essentially independent of angle of attack is indicated by the results of this investigation. (Author)

AD-A027 359/9GA PC$4.00/MF$3.00
Analytical Methods Inc Bellevue Wash
An Investigation of Separation Models for the Prediction of Maximum Lift.
Interim technical rept.,
B. Maskew, and F. A. Dvorak. 30 Jun 76, 29p
7602, ARO-13225.1-EX
Contract DAAG29-76-C-0019

Descriptors: *Flow separation, Viscous flow, *Airfoils, *Turbulent boundary layer, Lift, Vortices, Potential flow, Mathematical models, Aerodynamic characteristics, Drag, Shear stresses, Wind tunnel models.
Identifiers: Shear flow.

The research reported here has as its objective the development of a separation model which can be incorporated into existing viscous/potential flow interaction analysis. This would provide an engineering analysis tool which would be of considerable use to both rotary and fixed wing aerodynamicists. To implement this study, three separation models were considered. The different models investigated and the results to date are described. (Author)

AD-A027 514/9GA PC$4.00/MF$3.00
Naval Surface Weapons Center Dahlgren Lab Va
Simplified Solution of the Compressible Subsonic Lifting Surface Problem.
Final rept.,
J. W. Purvis. May 76, 33p Rept no. NSWC/DL-TR-3487

Descriptors: *Wings, *Lifting surfaces, Compressible flow, Subsonic flow, Aerodynamic loading, Damage, Load distribution, Thin wings.
Identifiers: *Damaged wings, Planar lifting surface theory.

A new technique for determining the spanwise and chordwise distribution of load, on thin finite wings in compressible subsonic flow, is presented. The method is based on the application of planar lifting surface theory. Classical theoretical results are used to define functions for the pressure coefficient distribution, and a new technique is presented for evaluating the kernel function integral. Analytical results are compared with experimental data and with solutions from a standard numerical integration method of applying lifting surface theory. Excellent correlation with experimental results is obtained for Mach numbers up to 0.80 to 0.85 for thin wings. Advantages of the new technique as opposed to other methods are also presented.

AD-A027 645/1GA PC$5.00/MF$3.00
General Dynamics/Convair San Diego Calif
Nonlinear Lifting Line Theory for Predicting Stalling Instabilities on Wings of Moderate Aspect Ratio.
Final technical rept. 30 Jun 75-15 Jun 76,
Stanley T. Piszkin, and E. S. Levinsky. 15 Jun 76, 97p Rept no. CASD-NSC-76-001
Contract N62269-75-C-0356

Descriptors: *Lifting surfaces, *Wing body configurations, *Angle of attack, *Aerodynamic characteristics, Mathematical prediction, Theory, Computations, Methodology, Nonlinear systems, Stalling, Nonuniform flow, Time dependence, Hysteresis, Structural engineering, Handbooks, Wake, Instability, Aspect ratio.
Identifiers: Design, Spin resistance, Lifting line theory.

A computational procedure has been developed for predicting the time dependent longitudinal and lateral aerodynamic characteristics of wing-body configurations at angles of attack up to and beyond stall. The purpose of the procedure is to provide the aircraft designer with a tool for simulating and alleviating such adverse wing stalling characteristics as wing rock, wing drop, loss of roll control or roll control reversal, etc. and thereby lead to the design of aircraft with improved stall, departure and spin resistance characteristics. The procedure is based on nonlinear lifting line theory which has been modified to include unsteady wake effects.

AD-A027 647/7GA PC$5.00/MF$3.00
West Virginia Univ Morgantown Dept of Aerospace Engineering
Inlet and Internal Aerodynamics of a VTOL Thrust Augmenter.
Final contract rept. 1 Jan 75-31 Jan 76,
John L. Loth, Subrato Chandra, and Edward H. Gibbs. 31 Jan 76, 96p TR-49, ONR-CR215-227-3F
Contract N00014-75-C-0324

Descriptors: *Vertical takeoff aircraft, *Thrust augmentation, *Aerodynamic characteristics, Thrust augmentor nozzles, Dynamic tests, Test facilities, Strain gages, Lift, Measurement, Flow fields, Mathematical analysis, Computer programming, Jet flaps, Turbofan engines, Takeoff, Inlets.
Identifiers: Transitional flight.

A new two dimensional thrust augmenter VTOL model has been designed, built and tested. The model has few moving parts and possibilities for good aerodynamic performance. A complete static test facility capable of supplying 30 psig air through 1.5 square inches nozzle for 2 minutes has been built for testing this model. The test rig can be moved in and out of ground effect by a fork lift. Instrumentation consists of strain gages to measure total lift and thrust.

AD-A027 712/9GA PC$4.50/MF$3.00
Advanced Technology Labs Inc Westbury N Y
An Analysis of Transonic Jet-Flapped Airfoils with the Inclusion of Viscous Effects.
Final rept. 1 Oct 73-20 Sep 75,
S. Eizweig, P. Baronti, and G. Miller. May 76, 52p ATL-TR-230, AFOSR-TR-76-0840
Contract F44620-74-C-0014

Descriptors: *Transonic airfoils, *Fluid dynamics, *Jet flaps, Inviscid flow, Viscous flow, Coupling(Interaction), Numerical integration, Relaxation, Angle of attack, Flow fields.

The inviscid and viscous effects associated with a jet-flapped airfoil in the transonic regime are investigated. Integral methods are used for the description of the viscous portions of the flow and a relaxation method is used for the inviscid portions. The viscous-inviscid coupling is delineated. Their coupling procedures along the wing and the jet acknowledge the importance and magnitude of the viscous effects on pressure distribution and directly incorporate the displacement effect on the wing and the effects of jet mixing into the boundary conditions for the computation of the entire flow. Preliminary numerical results are presented to validate the solution. A computer program for a systematic exploitation of the complete analysis is discussed.

N76-25143/8GA PC$9.25/MF$3.00
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Wind Tunnel Investigation of Nacelle-Airframe Interference at Mach Numbers of 0.9 to 1.4-Force Data.
D. P. Bencze. Feb 76, 283p NASA-TM-X-62489, A-4982

Descriptors: *Interference drag, *Nacelles, Wind tunnel tests, Aerodynamic characteristics, Body-wing configurations, Delta wings, Wind tunnel models.
Identifiers: *Airframes.

For abstract, see STAR 1416

N76-25144/8GA PC$11.00/MF$3.00
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Wind Tunnel Investigation of Nacelle-Airframe Interference at Mach Numbers of 0.9 to 1.4-Pressure Data, Volume 2.
D. P. Bencze. Feb 76, 423p NASA-TM-X-73088, A-4982
Seri-2.

Descriptors: *Aerodynamic interference, *Airframes, Delta wings, *Nacelles, Aerodynamic forces, Angle of attack, Pressure drag, Transonic speed, Wind tunnel tests.

For abstract, see STAR 1416

N76-25146/1GA PC$5.50/MF$3.00
Boeing Commercial Airplane Co., Seattle, Wash.
A Preliminary Design Study of a Laminar Flow Control Wing of Composite Materials for Long Range Transport Aircraft.
Final Report, Apr. 1975 - Mar. 1976.
G. R. Swinford. Apr 76, 125p NASA-CR-144950, D6-42967
Contract NAS1-13872

Descriptors: *Aircraft design, *Composite materials, Control surfaces, Wings, Aerodynamic characteristics, Aircraft configurations, Epoxy resins, Graphite, Structural design, Transport aircraft.

For abstract, see STAR 1416

1B. Aeronautics

AD-A027 386/7GA PC$4.00/MF$3.00
Naval Postgraduate School Monterey Calif
Trends in Major Aircraft Accident Rates.
Technical rept. Apr-Jun 76,

Gary K. Poock. Jun 76, 28p Rept no. NPS-55Pk76061

Descriptors: *Accident investigations, *Aviation accidents, Trends, Cycles, Naval air stations, Regression analysis, Correlation techniques, Variations, Rates, Aircraft.
Identifiers: Time Dependance.

A variety of approaches was taken to look for consistent cycles or trends in monthly major aircraft accident rates. Approaches are discussed looking at the data by years, commands and aircraft types. (Author)

PAT-APPL-679 410/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
Aircraft Conveyor Load Redistribution System.
Patent Application,
Gene A. Petry, Filed 22 Apr 76, 12p AD-D002 628/6
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Air transportable equipment, *Conveyors, *Load distribution, *Cargo aircraft, Pallets, Limiters, Rollers, Deformation, Transfer, Air drop operations, Variations.
Identifiers: *Patent applications, PAT-CL-193-35.

The patent application describes a cargo aircraft conveyor system having palletized loads supported on a plurality of rows of roller conveyors positioned side by side across the aircraft floor. It relates to air drop or transport aircraft.

1C. Aircraft

AD-A027 190/8GA PC$4.00/MF$3.00
Naval Electronics Lab Center San Diego Calif
FM-CW Ranging Multipath Investigation for Navy VTOL Aircraft.
Research rept. May 75-Apr 76,
F. E. Morris, S. K. Miyashiro, and B. H. Humpherys. 1 May 76, 47p Rept no. NELC/TR-1986

Descriptors: Range finding, Multipath tranemission, *Landing aids, *Distance measuring equipment, Frequency modulation, Continuous waves, Small ships, Vertical takeoff aircraft, Helicopters, Takeoff, Aircraft landings, Errors, All weather aviation, Shipboard, Naval aviation.

Evaluation of the range error caused by multipath in a FM-CW range measuring system has been accomplished analytically and experimentally. Tests show that the modulation index-frequency product will have to be significantly increased and the multipath signal levels suppressed by narrow-beam tracking antennas or by use of circularly polarized antennas to achieve 1-foot ranging accuracy in a severe multipath environment. Circular polarization provides a significant improvement against single reflection multipath signals from metal surfaces. Multipath tests show that the FM-CW equipment range accuracy is severely degraded in a strong multipath signal environment but that increasing the modulation index can provide an improvement. (Author)

AD-A027 206/2GA PC$6.75/MF$3.00
United Technologies Corp Stratford Conn Sikorsky Aircraft Div
Bonded Field-Replaceable Rotor Blade Pocket For the CH-54B. Volume I. Design Study.
Final rept.,
John A. Longobardi. Jun 76, 162p UTRC/64386, USAAMRDL-TR-75-25A
Contract DAAJ02-73-C-0076
See also report dated Feb 73, AD-759 956.

Descriptors: *Helicopter rotors, *Rotor blades(Rotary wings), *Replacement, *Field equipment, Maintenance, Adhesives, Bonding, Curing, Trailing edges, Fairings.
Identifiers: H-54 aircraft, CH-54B aircraft, Rotor blade pockets.

The present CH-54B main rotor blade consists of 28 nonstructural, trailing-edge fairings called pockets. Fourteen of these pockets are different in dimension because of the taper on the blade spar. The adhesive retaining the pockets to the blade is a high-temperature and -pressure system. For these reasons, damaged pockets are repaired at the factory because of high inventory of pockets and sophisticated tooling for the best-curing adhesive would be needed to make a field repair possible. Consequently, under previous contract with the Army (Contract DAAJ02-71-C-0022), the feasibility of developing a pocket and adhesive suitable for field application was investigated. The study resulted in a universal pocket design which could be utilized to replace any pocket on the CH-54B blade and an adhesive system which would cure at room temperature.

AD-A027 258/3GA PC$5.00/MF$3.00
Naval Postgraduate School Monterey Calif
A Study of the Failure of Joints in Composite Material Fuel Cells Due to Hydraulic Ram Loading.
Master's thesis,
Henry Speer Ezzard, Jr. Jun 76, 90p

Descriptors: *Aircraft equipment, *Fuel tanks, Hydraulic ram effect, *Composite materials, Tensile stress, Failure(Mechanics), Experimental design, Bending, Joints, Shear stresses, Selection, Cracks, Finite element analysis, Loads(Forces), Vertical takeoff aircraft.
Identifiers: F-18 aircraft, *Jet fighter, Theses.

The objectives of this research were to show the relative importance of the transverse shearing forces, the bending moments, and the tensile forces produced by hydraulic ram loading on military aircraft fuel tank joint designs for composite materials, and to present fuel tank test section designs. With the use of a finite element analysis, it was shown that the transverse shearing force may be major cause of attachment failure of composites, primarily by an unzipping or pull out mode of failure. It was also shown that failure criteria for transverse shearing stresses in composites are lacking. By comparing several specific aircraft design concepts, designs for a wing fuel test tank and a fuselage fuel test tank were selected. Simplicity, similarity to actual aircraft fuel tanks, and uniformity between experiments were primary considerations in the selection. (Author)

AD-A027 271/6GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Effect of Configuration Management on the Program Cost of the A-7D Aircraft.
Study project rept.,
David S. Powers. Nov 75, 50p
Report on Program Management Course.

Descriptors: *Attack aircraft, *Configuration management, Production control, Scheduling, Retrofitting, Management planning and control, Logistics, Cost analysis, Cost overruns.
Identifiers: *Engineering change proposals, A-7 aircraft, A-7D aircraft.

Too often, the stereotyped view of engineers and scientists is offered as the cause of out of control conditions resulting from excessive engineering changes and production line perturbations. The real cause of these problems is more likely the failure of management to exercise proper control through the application of high quality configuration management. The purpose of this study is to examine the techniques and procedures used by the Configuration Management Division of the A-7D System Program Office to keep changes and costs in balance despite the pressures exerted for change by various activities and events. The techniques described and the conclusions drawn will provide useful guidelines and a configuration management philosophy for use in any weapon system acquisition program.

AD-A027 280/7GA PC$3.50/MF$3.00
United Technologies Corp Stratford Conn Sikorsky Aircraft Div
Bonded Field-Replaceable Rotor Blade Pocket for the CH-54B. Volume II. Instruction Manual.
Final rept. 5 Jun 73-5 May 74,
John A. Longobardi. Jun 76, 24p SER-64385-Vol-2, USAAMRDL-TR-75-25B
Contract DAAJ02-73-C-0076
See also Volume 1, AD-A027 206.

Descriptors: *Rotor blades(Rotary wings), *Bonded joints, Repair, Maintenance, Replacement, Helicopters, Field equipment, Instruction manuals, Installation, Maintainability.
Identifiers: CH-54B Aircraft, H-54 Aircraft, *Rotor blade pockets.

Volume II presents the instructions for installing field-replaceable pockets on CH-54B main rotor blades. It is the end result of experience gained from in-house activity and army personnel installing pockets at Sikorsky's Stratford, Conn. plant and in the field at fort Wainwright, Alaska, and Fort Eustis, Va. The instruction manual is part of a self-contained kit which has all the necessary components to make a field repair. Volume I contains the results of pocket and adhesive development and evaluation; the final pocket design and adhesive were successfully proof load, fatigue, whirl and flight tested. (Author)

AD-A027 283/1GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
The RISE Summary as a Management Device.
Study project rept.,
J. R. Woods, Jr. Nov 75, 28p

Descriptors: *Aircraft maintenance, *Maintenance management, Management information systems, Data Bases, Naval aircraft, Operational readiness, Degradation, Reports, Logistics management, Project personnel, Integrated systems, Aircraft equipment, Components, Deficiencies, Systems analysis, Reliability, Maintainability.
Identifiers: 3M system, RISE summaries.

The Readiness Improvement Status Evaluation (RISE) Summary is a monthly readiness degradation ranking summary which lists the top ten aircraft systems contributing to the overall unreadiness of a particular aircraft; furthermore, it functions as a management information system that focuses highlevel attention on readiness improvement. The key individual in the readiness improvement program is the Project Manager (PMA). The RISE Summary provides the impetus for the interaction, with respect to aircraft system readiness improvement, between the PMA and the cognizant system Project Coordinator. Although the RISE summary is insufficient in level of detail to identify factors causing system unreadiness, its aviation 3-M data base contains the necessary information on component/subcomponent/part reliability and maintainability problems that cause system unreadiness. The methodology that enables the Project Coordinator to accomplish maintenance data analyses is presented in the report.

AD-A027 383/1GA PC$9.25/MF$3.00
United Technologies Corp Windsor Locks Conn Hamilton Standard Div
V/STOL Rotary Propulsion Systems - Noise Prediction and Reduction. Volume III. Computer Program User's Manual.
Final rept.,
B. Magliozzi. May 76, 300p FAA-RD-76-49-Vol-3
Contract DOT-FA74WA-3477
See also Volume 1, AD-A027 389.

Descriptors: *Vertical takeoff aircraft, *Short takeoff aircraft, Propulsion system components, *Aircraft noise, Computer programs, User needs, Instruction manuals, Predictions, Aircraft engine noise, Propeller noise, Lift fans, Jet engine noise, Noise reduction, Noise pollution, Helicopters.

A computer program is presented which allows a user to make performance and far-field acoustic noise predictions for free-air propellers, variable pitch fans with inlet guide vanes, variable pitch fans with outlet guide vanes, fixed pitch fans, helicopter rotors, tilt rotors, fixed pitch lift vanes with remote, integral, and tip-turbine drives, and variables pitch lift fans with remote and integral drives. Noise prediction methodology for drive engines, single stream and coaxial jets, and gearboxes are also included, as well as noise reduction and performance losses of partly sonic inlets and duct acoustic treatment. A description of the program, detailed instructions for its use, required inputs, and sample cases are presented. Related documents include Volume 1 - Identification of Sources, Noise Generating Mechanisms, Noise Reduction Mechanisms, and Prediction Methodology and Volume 2 - Graphical Prediction Methods. (Author)

AD-A027 387/2GA PC$4.50/MF$3.00
Air Force Academy Colo
The Effect of Thrust Vectoring on Aircraft Maneuvering.
Final rept. Oct 71-Aug 73,
Duane M. Davis, and Jerry D. Hines. Jun 76, 59p
Rept no. USAFA-TR-76-9

Descriptors: *Thrust vector control systems, Maneuverability, *Aircraft, Aerial warfare, Computerized simulation, Jet fighters, Mathematical models, Equations of motion, Atmosphere models, Thrust, Drag, Turning flight.

A 3-dimensional minimum time turn optimal control problem was used as a framework for a preliminary investigation of the effects of thrust vectoring. Two basic configurations were used for aircraft in the study. They were the same except that one has the thrust vector fixed along the longitudinal axis, and the thrust vector for the other is free to move in the aircraft vertical plane. The effect of initial velocity, weight penalty and thrust-to-weight ratio were investigated. The results show a definite advantage for the thrust vectored aircraft for most of the conditions investigated and the possibility of an advantage for the others. Therefore, more detailed analysis of the effect of thrust vectoring on combat maneuverability is justified. (Author)

AD-A027 389/8GA PC$6.00/MF$3.00
United Technologies Corp Windsor Locks Conn Hamilton Standard Div
V/STOL Rotary Propulsion Systems Noise Prediction and Reduction. Volume I. Identification of Sources, Noise Generating Mechanisms, Noise Reduction Mechanisms, and Prediction Methodology.
Final rept.,
B. Magliozzi. May 76, 145p FAA-RD-76-49.1
Contract DOT-FA74WA-3477
See also Volume 2, AD-A027 390.

Descriptors: *Vertical takeoff aircraft, *Short takeoff aircraft, *Propulsion system components, *Aircraft noise, Aircraft engine noise, Propeller noise, Lift fans, Noise generators, Jet engine noise, Noise reduction, Noise pollution.

The propulsion systems of current and future V/STOL vehicles can be defined as combinations of free-air propellers, shrouded propellers, variable pitch fans, fixed pitch fans, tilt rotors, helicopter rotors, lift fans, gearboxes, and drive engines. In this report, noise sources for each of these propulsors, gearboxes, and drive engines are identified and rank ordered. The noise generating mechanisms for each of the propulsor noise sources identified are defined and systematically catalogued. Three approaches to reduction of propulsor noise are discussed: changes in physical geometry, changes in design operating conditions, and the use of acoustic treatments. Computerized and graphical procedures based on methodology from the open literature and at United Technologies Corp., are presented for predicting aerodynamic performance of and noise from the V/STOL propulsors identified in this study. The developed methodology allows the user to estimate the achieved noise reduction as well as the incurred performance penalties of noise reduction design features and noise attenuation devices such as partly sonic inlets and acoustic treatment. It is shown that much of the noise generating mechanism substantiation data and prediction methodology are based on static operation. Forward flight effects have recently been recognized as having a significant effect on the noise sources. Therefore, forward flight effect corrections are included in the methodology, but these have not been fully substantiated due to lack of data.

AD-A027 390/4GA PC$9.25/MF$3.00
United Technologies Corp Windsor Locks Conn Hamilton Standard Div
V/STOL Rotary Propulsion Systems Noise Prediction and Reduction. Volume II. Graphical Prediction Methods.
Final rept.,
B. Magliozzi. May 76, 299p FAA-RD-76-49.2
Contract DOT-FA74WA-3477
See also Volume 1, AD-A027 389.

Descriptors: *Vertical takeoff aircraft, *Short takeoff aircraft, *Propulsion system components, *Aircraft noise, Aircraft engine noise, Propeller noise, Lift fans, Noise generators, Jet engine noise, Noise reduction, Noise pollution, Predictions.
Identifiers: *Graphic methods.

Graphical procedures for estimating noise and performance of free-air propellers, variable pitch fans with inlet guide vanes, variable pitch fans with outlet guide vanes, fixed pitch fans, helicopter rotors, tilt rotors, and lift fans are presented. Noise prediction methods for drive engines, gearboxes, jets with and without bypass flow, as well as noise reduction and performance losses for partly sonic inlets and duct linings are also presented. These graphical methods are parallel to those developed for the computer program discussed in Volume 3 of this report to the extent possible without their becoming too involved and tedious to use. The procedures are extensive and applicable to a wide variety of V/STOL propulsor systems, including present and future V/STOL vehicles. The methods have been validated with available data wherever possible. However, high quality data for isolated propulsors which is free from contamination by other sources and ground reflections is somewhat limited, particularly for forward flight conditions.

AD-A027 419/1GA PC$4.50/MF$3.00
Illinois Univ At Urbana-Champaign Savoy Aviation Research Lab
A Versatile Computer-Generated Dynamic Flight Display.
Technical rept.,
Bruce Arthur Artwick. May 76, 75p Rept no. ARL-76-5/ONR-76-1
Contract N00014-76-C-0061

Descriptors: *Flight instruments, *Display systems, Computer programs, Navigation computers, Fortran, Computer graphics, Analog systems, Three dimensional, Cockpits, Landing aids, Navigational aids, *Aircraft landings, Attitude control systems, Flight simulation, Modular construction, Microcomputers, Optical images, Synthesis.
Identifiers: Aviation instrumentation, Pursuit displays, Predictor displays, Contact analogs displays.

This report describes a real-time, dynamic, computer-driven visual display program which is written in the Fortran programming language. Versatility, efficiency and ease of use are stressed in the development, resulting in an easy to interface to dynamic display which can be implemented economically with a bare minimum of graphics hardware and a sixteen bit mini-computer which has Fortran capabilities. Modular structure is stressed and speedup methods are discussed including the use of a matrix multiplier. A unique frame synthesizing feature is described in detail. Sample data base structures and display images conclude the report. (Author)

AD-A027 422/5GA PC$6.75/MF$3.00
Dayton Univ Ohio School of Engineering
Landing Gear/Soil Interaction Development of Criteria for Aircraft Operation on Soil During Turning and Multipass Operations.
Final rept. 1 Jan 74-15 May 75,
David C. Kraft, and Norman S. Phillips. Oct 75,
175p AFFDL-TR-75-78
Contract F33615-73-C-3023

Descriptors: *Soil mechanics, *Runways, *Landing gear, Military aircraft, Aircraft tires, Drag, Loads(Forces), High velocity, Equations, Data reduction, Surface roughness, Interactions, Standards.
Identifiers: Unimproved runways, *Soil wheel interactions.

The continuing design and operational requirements for military aircraft to operate on unimproved runways has led to the need to investigate those landing gear/soil runway parameters which most significantly influence performance. This report summarized those activities accomplished during the second year of a two-year research effort concerned with the development of criteria for turning, operation at high speed, and multipass operation. The work reported was conducted in several areas. The turned tire test data was completely analyzed and predictive equations incorporated into the turning program. A limited parametric study was conducted for three classes of vehicles to calculate wheel force ratios as functions of runway width required. A multipass test program was conducted at the Army Engineers Waterways Experiment Station to measure the response of rolling and braked tires in alternating paths. The data was reduced and predictive equations evolved from rut depths as a function of first pass response and subsequent path and braking. Limited start-up force data were examined to determine a preliminary estimate of start-up drag ratios. A soft tire/soil computer program was developed to study roughness effects.

AD-A027 434/0GA PC$6.00/MF$3.00
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
Realization of a Voter/Monitor for a Digital Flight Control System.
Final rept.,
Jesse E. Bush. Jun 76, 148p Rept no. GE/EE/76J-7
Master's thesis.

Descriptors: *Flight control systems, Digital systems, *Information processing, *Microcomputers, Monitors, Data processing, Computer programs, Data transmission systems, Theses, Signal processing, Flight simulation.
Identifiers: Software voter/monitor, IMP 16l microcomputers, Input input comparison monitoring, Input devices.

A software Voter/Monitor (V/M) system is designed and implemented. The V/M is an informational processing device which is to be used in a digital flight control system (DFCS). A DFCS is currently being developed to replace existing analogue flight control systems in selective military aircrafts. The V/M receives data over four separate input channels, and it performs a processing routine which (a) allows it to continually select one of the input channel data for routing over its single output channel; and (b) allows it to maintain a history of each input channel data for routing over its single output channel; and (b) allows it to maintain a history of each input channel performance and declare as defective any input channel from which it consistently receives 'bad' data. The V/M is implemented using the National Semiconductor IMP-16L Microcomputer. The V/M processing scheme uses input-input comparison monitoring. Software coding and hardware circuitry are designed. Additionally, a software test program is constructed. The V/M system testing is limited. The correct performance of the V/M system is illustrated under a static testing environment.

AD-A027 446/4GA PC$8.00/MF$3.00
Ppg Industries Inc Pittsburgh Pa Glass Research Center
Improved Windshield and Canopy Protection Development Program.
Final technical rept. 7 Mar 73-1 May 74,
H. Edward Littell, Jr. Jun 74, 244p NP-1132,
AFFDL-TR-74-75
Contract F33615-73-C-3099

Descriptors: *Aircraft canopies, *Windshields, Optical properties, Impact strength, Birds, Thermal properties, Transparence, Pressure, Mechanical properties, Tensile properties, Selection, Prototypes, Interfaces, Deflection, Performance(Engineering), Structural properties.
Identifiers: *Bird strikes.

The report discusses a program to develop high performance aircraft windshields and canopies capable of sustaining impacts by 4 lb birds at speeds of 500 knots and above. A multi-task program evaluated not only bird impact resistance but structural and thermal qualities of materials and designs which influenced overall performance. In the first task, basic material and design properties were established and constructions proposed for full-scale thermal and bird impact testing. Thermal tests on complete windshields compared glass-plastic vs. all-plastic configurations, while bird impacts established the effect of impact location, panel design and support structure. Conclusions from the test portion were the basis of constructions selected for prototype production.

AD-A027 559/4GA PC$4.00/MF$3.00
Army Materiel Systems Analysis Activity Aberdeen Proving Ground Md
Design Comparison Between Helicopter and Tilt Rotor Aircraft.
Technical rept.,
R. R. Oehrli. Feb 76, 40p Rept no. AMSAA-TR-153

Descriptors: *Helicopters, Computer programs, Comparison, *Helicopter rotors, Lift, Thrust, Pitch(Motion).
Identifiers: *Tilt rotor aircraft.

A version of the AMSAA helicopter design program has been modified to include a tilt rotor analysis. This modification includes addition of a rotor strip theory performance analysis in the rigid mode. A series of studies have recently been completed with this analysis and this note has been prepared as a record of the procedures used. A discussion of the analysis and some example problems are shown. These indicate the size trade offs that are required to obtain the high speed advantage of a typical tilt rotor compared to a helicopter. (Author)

AD-A027 572/7GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
A Viable Alternative to Support an Unsupportable Weapons System.
Study project rept.,
James B. Gasho. May 75, 28p

Descriptors: *Aircraft maintenance, *Logistics support, Avionics, Weapon systems, Repair, Emergencies, Logistics management, Maintenance management, Operational readiness, Malfunctions, Failure, Defects(Materials), Contract administration, Air Force Logistics Command, Air Force Systems Command.

This report describes, in limited detail, an alternative by which a new aircraft weapons system, utilizing state-of-the-art or modified off-the-shelf avionics, on the verge of delivery can be supported when poor planning, inadequate procurement practices, or mismanagement present problems that preclude an orderly, efficient, and operationally effective deployment. Recent history with avionics systems has shown that unanticipated problems, as well as known problems, for which there was not adequate resolution have resulted in gross program cost overruns, intolerable delays in weapons systems delivery, contractor work stoppages, and avionics systems that have failed by a wide margin to meet contract specifications. By use of the combined and concentrated resources of the contractor, Air Force Logistics and Systems Command, and the user at the base to which the aircraft will be delivered, an interim procedure of logistics, engineering, and maintenance support can be employed to minimize supportability problems associated with the deployment of known defective avionics systems.

AD-A027 638/6GA PC$5.00/MF$3.00
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
Mini RPV Engine Noise Reduction.
Final rept. May 74-Aug 75,
Ralph M. Shimovetz, and Davey L. Smith. Mar 76, 97p Rept no. AFFDL-TR-76-28
ARPA Order-2707

Descriptors: *Remotely piloted vehicles, *Rotary combustion engines, *Reciprocating engines, *Aircraft engine noise, Detection, Noise reduction, Hearing.
Identifiers: Mini-remotely piloted vehicles, Praeire aircraft, Calere aircraft.

The purpose of this effort was to investigate the reduction in radiated acoustic noise associated with two types of engines considered for power plants in small (75-100 lb.) remotely piloted vehicles (Mini RPV) in the class of the Praeire and Calere Aircraft. The two engines considered are approximately 5 HP; the first a rotary combustion (RC), the second a two stroke cycle reciprocating (P). The sound pressure levels were recorded using a semicircle arrangement of microphones in a free field and with various engine noise reduction devices installed. The engines were rotated such that a spherical definition of the acoustic pressures were made. From these data the sound power levels and directional characteristics were determined. Aural detection analyses are performed for the most desirable noise reduction cases. The computed aural detection altitudes and the most significant sources of noise were defined. (Author)

AD-A027 664/2GA PC$4.50/MF$3.00
Army Aeromedical Research Lab Fort Rucker Ala
Attenuation of Light Transmission in Army Aircraft Transparencies Due to Slanting.
Final rept.,
Wun C. Chiou, Chun K. Park, and Chris E. Moser. Jun 76, 56p Rept no. USAARL-76-23

Descriptors: Transparent panels, *Windshields, *Light transmission, Vision, *Aircraft, Helicopters, Reduction, Attenuation, Optics, Armor, Glass, Colors, Angles, Graphs, Tables(Data).
Identifiers: Tinting, Slanting, CH-54 aircraft, H-54 aircraft, UH-1 aircraft, H-1 aircraft.

The rates of light transmission reduction due to the slanting in eight fixed wing and fourteen rotary wing aircraft transparencies have been examined. It was found that the optical quality at various portions of the UH-1 transparencies and all the fixed wing samples possess similar characteristics of transmission reduction. The windscreen and the armor glass of CH-54 samples are similar too. But the tinted versus the clear AH-1G transparencies are quite different. The tinted sample generally has 27% spectral transmission loss compared to that of the clear sample. This reduction could constitute a dangerous loss of visibility for the aviator, especially during periods of reduced illumination and at night. The results presented in this study enable the potential users of the optical as well as the electro-optical devices to compute the amount of transmission reduction in most of the current Army aircraft. (Author)

AD-A027 689/9GA PC$6.75/MF$3.00
Rockwell International Columbus Ohio Columbus Aircraft Div
Digital Fly-by-Wire Technology Study. Volume I.
Final rept. 3 Jul 75-2 Mar 76,
William S. Andrews. Mar 76, 165p Rept no. NR76H-33-Vol-1
Contract N62269-75-C-0423

Descriptors: *Fly by wire control, Digital systems, *Vertical takeoff aircraft, Survival(General), Maintainability, Reliability, Life cycle costs, Performance(Engineering).
Identifiers: FV-12A aircraft.

This report documents the study conducted to determine the benefits and penalties associated with configuring the FV-12A high performance V/STOL aircraft with a Digital Fly-by-Wire flight control system. The items considered were reliability, maintainability, survivability, aircraft performance, mission effectiveness, and impact on life cycle costs. An analysis based upon weighting factors was defined to consolidate the benefits/penalties into an overall figure of merit. (Author)

AD-A027 720/2GA PC$8.00/MF$3.00
Georgia Inst of Tech Atlanta School of Engineering Science and Mechanics
Minimum Weight Design of Stiffened Cylinders and Cylindrical Panels under Combined Loads.
Interim rept. 1 Feb 75-31 Jan 76,
George J. Simitses, Jagannath Giri, and Izhak Sheinman. Mar 76, 233p AFOSR-TR-76-0930
Grant AF-AFOSR-2655-74

Descriptors: *Fuselages, *Aerodynamic loading, Stiffened cylinders, Airplane panels, Cylindrical bodies, Shells(Structural forms), Compressive properties, Torsion, Computer programs.
Identifiers: Cylindrical panels, Design criteria, Cylindrical shells.

This report is divided into two parts, Parts A and B. In Part A, a methodology is presented for the minimum weight design of stiffened cylinders under combined loads of torsion, uniform axial compression and pressure. A number of illustrative examples are included in order to demonstrate the methodology. In addition, the listing of the developed computer program is included and thus those interested in the program can easily use it. In Part B, a methodology is presented for the minimum weight design of stiffened curved plates under combined shear with uniaxial or biaxial compression. This methodology is illustrated through a number of examples. At the end of this second part a complete listing of the developed computer programs is included along with the associated flow charts for data preparation. The load cases considered in both parts are representative of the worst possible load cases of destabilizing loads that an aircraft fuselage is expected to encounter. The methods developed represent a fully automated design procedure for that portion of the fuselage which is designed primarily against general instability.

AD-B000 924/1GA PC$7.50/MF$3.00
Hitec Corp Westford Mass
Development of Strain and Temperature Measurement Techniques for Use in Combined Thermal Acoustic Environment.
Final rept. 19 Mar 73-19 Mar 74,
Stephen P. Wnuk, Jr., Malcolm E. Low, and John G. MacLean. Oct 74, 193p AFFDL-TR-74-95
Contract F33615-73-C-3052
Distribution limitation now removed.

Descriptors: (*Strain(Mechanics), *Measuring instruments), (*Temperature measuring instruments, *Aircraft), Sonic fatigue, High temperature, Noise(Sound), Jet engines, Vibration, Test equipment, Performance(Engineering), Ceramic materials, Adhesive bonding, Flame spraying, Attachment, Aircraft engines, Strain gages, Installation, Lead wires, Airframes, Thermocouples, Resistance thermometers, Circuits, Compensation, Calibration.

This report covers the development of instrumentation techniques for strain and temperature measurements on aerospace test structures in a combined high temperature and acoustic noise environment. Techniques for attaching instrumentation to test panels for vibratory testing up to 1400 F were developed and evaluated at the AFFDL Sonic Fatigue Facility. Methods for measuring static strains for short periods (up to one hour) at 1200 F were also developed. Strain gages, temperature sensor lead wire selections and installation techniques are covered in the report. (Author)

AD-B002 067/7GA PC$6.00/MF$3.00
Wyle Labs Hampton VA
Correlation of Actual and Analytical Helicopter Aural Detection Criteria. Volume I.
Final contractor rept. Mar 73-Dec 74,
A Louis Abrahamson. Jan 75, 135p USAAMRDL-TR-14-102A
Contract DAAJ02-73-C-0057
Distribution limitation now removed.

Descriptors: (*Aircraft noise, *Helicopters), (*Aircraft detection, *Auditory perception), Sound transmission, Aircraft noise, Hearing, Factor analysis, Range(Distance), Attention, Army personnel, Terrain, Masking, Attenuation, Ambient noise, Flight paths, Meteorological data, Experimental data, Data reduction, Statistical analysis, Mathematical models, Validation, Field tests, Correlation techniques, Aerodynamic noise, Jet engine noise, Gear noise, Wind, Low altitude, Power spectra, Tactical air support, Army aircraft.
Identifiers: *Helicopter noise.

This study was conceived as a basic experiment for measurement of helicopter aural detectability, and for assessment of the accuracy of a model developed by Ollerhead for computing aural detection distances. The experiment was conducted over a period of two weeks at NASA Wallops Station utilizing 25 Army personnel as listening subjects, and three different types of helicopters currently in Army service. The effect of the following parameters was investigated: ambient noise level, flight profile, listener attentiveness, atmospheric conditions. Reduction of data was executed using a new procedure for simulating aural frequency decomposition of sound. Correlation with Ollerhead's model confirmed his laboratory-derived detectability criterion as a median case for individual response and allowed extension of the criterion in the context of a measured statistical distribution. Published data included in Ollerhead's model for sound attenuation, other than for atmospheric absorption, was found to be inapplicable and a new comprehensive attenuation model based on measured results was formulated. Comparison of theoretical results, derived using the improved model for predicting helicopter aural detection distances, with measured values provided satisfactory correlation. (Author)

NTIS/PS-76/0515/9GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Closed Loop Control Systems. Part 1. Aircraft (A Bibliography with Abstracts).
Rept. for 1975-Jun 76,
Guy E. Habercom, Jr. Aug 76, 37p
Updates NTIS/PS-75/364.

Descriptors: *Bibliographies, *Feedback control, Automatic control, Adaptive systems, Flight control, Drone aircraft, Aircraft, Guidance.
Identifiers: *Closed loop systems, *Remotely piloted vehicles.

Adaptive control and feedback control closed loop systems relative to aircraft flight control are investigated. Studies on guidance and control of drones and remotely piloted vehicles are included. (Contains 32 abstracts) See also NTIS/PS-76/0636, Control Theory. Vol. 2. 1974-July, 1976 and NTIS/PS-75/503, Control Theory. Vol. 1. 1970-1973.

N76-25153/7GA PC$8.00/MF$3.00
Franklin Inst. Research Labs., Philadelphia, Pa. Dept. of Science Information Services.
Directory of Aerospace Safety Specialized Information Sources, Volume 2.
R. I. Rubinstein, J. J. Pinto, and S. Z. Meschkow. Apr 76, 246p NASA-CR-134929
Contract NAS3-19062

Descriptors: *Aircraft safety, Information systems, Accident investigation, Aerospace engineering, *Aircraft design, Flight hazards.

For abstract, see STAR 1416

N76-25158/0GA PC$4.00/MF$3.00
Old Dominion Univ. Research Foundation, Norfolk, Va.
Wind Tunnel Design Studies and Technical Evaluation of Advanced Cargo Aircraft Concepts.
Final Report.
D. M. Rao. May 76, 36p NASA-CR-148149, TR-76-T11
Grant NSG-1135

Descriptors: *Cargo aircraft, Wind tunnel tests, *Aerodynamic characteristics, Wind tunnel models, Wind tunnel nozzles.

For abstract, see STAR 1416

N76-25157/8GA PC$7.75/MF$3.00
Boeing Commercial Airplane Co., Seattle, Wash.
Technical and Economic Assessment of Span-Distributed Loading Cargo Aircraft Concepts.
Final Report.
D. H. Whitlow, and P. C. Whitner. Jun 76, 218p NASA-CR-144963, D6-75776
Contract NAS1-13963

Descriptors: *Aircraft design, *Cargo aircraft, Unswept wings, Wing loading, Aerodynamic configurations, Aspect ratio, Economic factors, Payloads, Technology assessment.

For abstract, see STAR 1416

N76-25166/9GA PC$3.50/MF$3.00
Kanner (Leo) Associates, Redwood City, Calif.
Research on Aircraft Noise: Test Methods.
G. Casandjian. Jun 76, 20p NASA-TT-F-17090
Contract NASW-2790
Tran-Transl. Into English from "La Rech. Sur le Bruit des Avions - Methodes et Moyens d'Essais," Assoc. Aeronaut. Et Astronaut. De France, Congres Intern. Astronaut, 12TH France (Paris), 29-30 Nov. 1975 18 p.

Descriptors: *Aircraft noise, Noise measurement, *Noise reduction, Test facilities, Acoustic attenuation, Acoustic ducts, Aerodynamic noise, Engine noise, Turbocompressors.
Identifiers: France, Translations, *Noise pollution.

For abstract, see STAR 1416

N76-25168/5GA PC$6.00/MF$3.00
Lockheed-California Co., Burbank.
Sonic Environment of Aircraft Structure Immersed in a Supersonic Jet Flow Stream.
Report, Jun. 1975 - Feb. 1976.
W. A. Guinn, F. J. Balena, and J. Soovere. Jun 76, 129p NASA-CR-144996, LR-27338
Contract NAS1-13978

Descriptors: Acoustic attenuation, *Aircraft noise, *Aircraft structures, Supersonic jet flow, Bandwidth, Body-wing configurations, Cross correlation, Scale models, Supersonic transports.
Identifiers: *Noise pollution.

For abstract, see STAR 1416

N76-25562/9GA PC$4.00/MF$3.00
Rensselaer Polytechnic Inst., Troy, N.Y. Tribiology Lab.
Effect of Design Factors on Surface Temperature and Wear in Disk Brakes.
J. J. Santini, F. E. Kennedy, and F. F. Ling. May 76, 39p NASA-CR-134923
Contract NGR-33-016-152

Descriptors: *Aircraft brakes, Disks (Shapes), *Structural design criteria, Surface temperature, Friction reduction, Slots, Temperature distribution, Wear tests.
Identifiers: Wear resistance.

For abstract, see STAR 1416

N76-25577/7GA PC$6.75/MF$3.00
Martin Marietta Corp., Orlando, Fla.
NDE: An Effective Approach to Improved Reliability and Safety. A Technology Survey.
J. L. Carpenter, Jr., and W. F. Stuhrke. Jun 76, 167p NASA-CR-134963, OR-14176
Contract NAS3-19530

Descriptors: Abstracts, *Aircraft structures, *Nondestructive tests, Structural reliability, Diffusion, Eddy currents, Magnetic measurement, Radiography, Ultrasonic tests.
Identifiers: *Technology assessment.

For abstract, see STAR 1416

N76-71008/1GA PC$9.75/MF$3.00
LTV Aerospace Corp., Hampton, Va. Technical Center.
Advanced Supersonic Technology Concept Study Reference Characteristics,
R. R. Lynch, C. Driver, C. W. Pearce, and J. D. Pride, Jr. 21 Dec 73, 307p NASA-CR-132374
Contract NAS1-10900

Descriptors: *Supersonic transports, *Design criteria, Aerodynamics, Flight control systems, Aerodynamic stability, Turbojet engines, Noise reduction, Mission profiles, Aerodynamic configurations.
Identifiers: *Baseline configurations, *Configuration management, *Computer aided design.

The objective of this study is to identify a reference configuration concept for 2 supersonic transports and the associated characteristics obtainable through the application of the results of recent research. This concept is a 292 passenger M 2.7 design with a subsonic leading edge wing and utilizes four dry turbojet engines for propulsion. The engines use the variable geometry turbine feature to reduce the engine-size required to meet the FAR 36 noise requirements. The wing geometry has been refined to provide improvements in stability and control, and performance indicated by extensive wind tunnel tests. The Boeing 1968 study concept is used as a base from which the current study concept and characteristics are developed. It is anticipated that the present reference study configuration will provide a reasonable baseline for future trade studies and for application of further technology improvements.

PATENT-3 687 151 Not available NTIS
Department of the Navy Washington D C
Apparatus and Method for Controlling the Inflation Time and Applied Snatch Forces on a Parachute.
Patent,
Jon T. Matsuo. Filed 28 Nov 73, patented 3 Jun 75, 7p AD-D002 630/2, PAT-APPL-419 851
Supersedes AD-D000 515.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Parachutes, *Suspension devices, *Patents, Inflating, Time, Control systems, Cordage, Force(Mechanics), Rupture.
Identifiers: Snatch forces, Breakcords, PAT-CL-244-152.

This invention relates to parachutes and more particularly to parachutes employing a variable-length control line for inflation time control. The invention controls the inflation time of the drag surface with a single set of conventional suspension lines and a single extendable control line that variably changes or distorts the configuration of the drag surface in the squidded and inflated conditions.

1E. Air Facilities

AD-A027 185/9GA PC$4.00/MF$3.00
Peat Marwick Mitchell and Co San Francisco Calif
Summary Report of the St. Louis Airport Investigation - Phase II,
Dan G. Haney. Nov 75, 47p OST-TPI-40176-7
Contract DOT-OS-40176
See also AD-A026 785.

Descriptors: *Air transportation, Mathematical models, *Terminal flight facilities, Landing fields, Forecasting, Aircraft noise, Air pollution, Assessment, Economic analysis, Saint Louis(Missouri).
Identifiers: Airports, Evaluation, Aviation, *Civil aviation.

Based on forecasts of aviation activity presented in earlier reports under this contract, the Phase II investigation is a comparison of alternatives to meet the demand for air service in St. Louis. The study evaluated alternative transfer dates for initiation of air service from a proposed site near Columbia-Waterloo, Illinois, at 1985, 1990, 1995, and 2000. The evaluation considered economic and noneconomic impacts. Analyses were conducted of airport construction costs, airfield operations costs, airport access facilities costs, airport access travel costs, aircraft noise, air pollution, natural environment impacts, and community development and land use impacts. A financial evaluation was also conducted. A number of sensitivity analyses were also conducted to assist in comparing the alternatives. (Author)

2. AGRICULTURE

2B. Agricultural Economics

PB-255 458/2GA PC$4.00/MF$3.00
Washington Univ., St. Louis, Mo. Center for the Biology of Natural Systems.
Organic and Conventional Crop Production in the Corn Belt: A Comparison of Economic Performance and Energy Use for Selected Farms,
W. Lockeretz, R. Klepper, B. Commoner, M. Gertler, and S. Fast. Jun 76, 49p* CBNS-AE-7, NSF/RA-760084
Grant NSF-AER-75-19031

Descriptors: *Farm crops, *Fertilizers, *Pesticides, *Agricultural economics, Grain crops, Corn plants, Output, Market value, Correlation techniques, Nutrients, Cost estimates, Manpower, Efficiency, Farms.
Identifiers: *Conventional farming, *Organic farming, Energy use.

The report describes a two year study of fourteen pairs of crop-livestock farms in the Corn Belt, in which one member of each pair used only organic fertilization methods and no pesticides, while the other used conventional fertilizers and pesticides. Data are presented on the yields, production costs, and net returns of crop production on these farms for 1974 and 1975. Results also are given on the comparative energy consumption, labor intensiveness, and plant nutrient balance.

2C. Agricultural Engineering

N76-25630/4GA PC$10.00/MF$3.00
TRW Systems Group, Redondo Beach, Calif.
LACIE Performance Predictor Final Operational Capability Program Description, Volume 1.
May 76, 339p NASA-CR-147755, TRW-28234-6027-RU-00-V-1
Contract NAS9-14547
Seri-3.

Descriptors: *Computer programs, *Large area crop inventory experiment, *Orbit calculation, *Satellite orbits, Earth resources, Ephemerides, Error detection codes, Fortran, Landsat satellites, Performance prediction, Satellite observation, Weather, Wheat.

For abstract, see STAR 1416

N76-25631/3GA PC$10.75/MF$3.00
TRW Systems Group, Redondo Beach, Calif.
LACIE Performance Predictor Final Operational Capability Program Description, Volume 2.
May 76, 394p NASA-CR-147756, TRW-28234-6028-RU-00-V-2
Contract NAS9-14547
Seri-3.

Descriptors: *Computer programs, *Large area crop inventory experiment, *Satellite orbits, Earth resources, Fortran, Landsat satellites, Performance prediction, Satellite observation, Weather, Wheat.

For abstract, see STAR 1416

N76-25632/0GA PC$13.00/MF$3.00
TRW Systems Group, Redondo Beach, Calif.
LACIE Performance Predictor Final Operational Capability Program Description, Volume 3.
May 76, 535p NASA-CR-147757, TRW-28234-6029-RU-00-V-3
Contract NAS9-14547
Seri-3.

Descriptors: *Computer programs, *Error detection codes, *Large area crop inventory experiment, Earth resources, FORTRAN, Landsat satellites, Monte Carlo method, Performance prediction, Production, Wheat.

For abstract, see STAR 1416

N76-25633/8GA PC$8.00/MF$3.00
TRW Systems Group, Redondo Beach, Calif.
LACIE Performance Predictor FOC Users Manual.
1 May 76, 227p NASA-CR-147745, TRW-28234-6025-RU-00
Contract NAS9-14547

Descriptors: *Computer programs, *Large area crop inventory experiment, *User manuals (Computer programs), *Wheat, Computerized simulation, Data acquisition, Earth resources, Error analysis, Fortran, Landsat satellites, Pattern recognition, Performance prediction, Production, Satellite observation, Satellite orbits.

For abstract, see STAR 1416

PB-255 021/8GA PC$4.00/MF$3.00
Kansas Water Resources Research Inst., Manhattan.
Swine Waste Digestion Enhancement with Nutrient Separation.
Project completion rept. 1 Jul 74-30 Jun 75,
Lawrence A. Schmid, and Ralph I. Lipper. Jun 76, 37p Contrib-173, W76-10128, , OWRT-A-063-KAN(1)
Contract DI-14-31-0001-5016

Descriptors: *Agricultural wastes, *Digestion(Decomposition), *Swine, *Industrial waste treatment, Anaerobic processes, Waste water, Mixing, Separation, Ammonia, Stripping(Distillation), Removal, Carbon dioxide, Methane, pH, Anaerobic bacteria, Nutrients.

A swine waste anaerobic digester receiving the waste from 80 boars was operated for a period of ten months. Digester mixing and nutrient removal were accomplished by the recirculation of digester gases through two stripping units. Phosphoric acid was used to strip ammonia from the recirculated gas stream. Caustic solutions, primarily lime, were used to strip carbon dioxide. The removal of carbon dioxide resulted in an elevation of digester pH to 8.0. At the elevated pH ammonia was more readily stripped. A system specific ammonia desorption coefficient was determined which may be used for selecting gas flow rates. The selection of the proper gas flow rate can pro-

vide the required degree of ammonia removal to reduce ammonia concentrations to levels non-toxic to anaerobic bacteria.

PB-255 168/7GA PC$50.00
National Technical Information Service, Springfield, Va.
Government Inventions Presented at the AGRO-Chemical Seminar, Held at Department of Commerce Auditorium, Washington, D.C., May 20, 1976.
1976, 458p

Descriptors: *Patents, *Food processing, *Pest control, *Fertilizers, *Meetings, Cotton fabrics, Proteins, Hydrolysis, Manufacturing, Dried foods, Ammonium compounds, Nematoda, Mulches, Ammonium nitrates.
Identifiers: Ammonium phosphates.

NTIS in cooperation with four other Federal agencies sponsored a seminar recently which featured the most promising new government-owned agro-chemical inventions available for licensing. Thirty-two inventions were described by inventors during the seminar. Some of the more interesting inventions presented included: An Improved Cheesemaking Process - reduces processing time up to 50%; reduces costs; improves flavor, body, and texture of most natural cheeses; control of Nematodes and Other Helminths - compounds are lethal at early larval stage of nematodes' grown cycle at concentrations far below materials currently used; degradable Starch Base Mulch Film - controls weeds, warms soil, controls moisture, and disintegrates when job is done; process for Rapid Dyeing of Textiles - highspeed process takes 2 to 10 seconds versus one hour; and many more. This document contains a copy of all of these inventions. Portions of this document are not fully legible.

PB-255 433/5GA PC$4.50/MF$3.00
Washington Univ., St. Louis, Mo. Center for the Biology of Natural Systems.
An Economic Analysis of Irrigated Farming with Diminishing Ground Water Reserves,
Ajay K. Sanghi, and Robert Klepper. May 76, 57p CBNS-AE-8, NSF/RA-760084
Grant NSF-AER75-19031

Descriptors: *Irrigation, *Water supply, Economic analysis, Farm crops, Economic factors, Plant growth, Water table, Ground water, Droughts, Production, Economic models, Output, Corn plants.
Identifiers: Microeconomics.

The report proposes a method for the determination of economic returns at the micro level to crops irrigated from diminishing ground water reserves. The method rests on a production function that incorporates the availability of water in a critical period of plant growth and differentiates between the effect of a water deficit on yield in the critical period and other stages of plant growth. Hypothetical examples of corn under center pivot irrigation with declining water tables are used to demonstrate the method.

PB-255 444/2GA PC$4.50/MF$3.00
Dana Larson Roubal and Associates, Pierre, S. Dak.
Irrigation Feasibility Study - Crow Creek Tribal Farm, Crow Creek Reservation, South Dakota.
Engineering rept. 1976.
May 76, 55p
Grant EDA-05-06-01566
Prepared in cooperation with Crow Creek Sioux Tribal Council, Fort Thompson, S. Dak.

Descriptors: *Irrigation, *Economic development, Soil properties, Climate, Water quality, Farm crops, American Indians, Technical assistance, Feasibility, Cost estimates, Recommendations, South Dakota.
Identifiers: Indian reservations, Sioux Indians.

The purpose of the study is to investigate and recommend whether irrigation should be used on the Tribal Farm of the Crow Creek Sioux Reservation. Geographical conditions, various proposed irrigation methods, cropping systems, and project phasing are presented for consideration. Estimated project costs are given and final recommendations made.

PB-255 792/4GA PC$4.00/MF$3.00
Texas A and M Univ., College Station. Water Resources Inst.
Adjustments Due to a Declining Groundwater Supply: High Plains of Northern Texas and Western Oklahoma.
Technical rept.,
Ronald D. Lacewell, Lonnie L. Jones, and James E. Osborn. Jun 76, 47p TR-74, W76-10874, , OWRT-B-179-TEX(2)
Contract DI-14-31-0001-4165

Descriptors: *Water supply, *Ground water, *Irrigation, Aquifers, Economic factors, Output, Agriculture, Cost analysis, Linear programming, Mathematical models, Regional planning, Policies, Texas, Oklahoma.
Identifiers: Ogallala aquifer, High Plains Region(United States).

Reduced annual withdrawals of groundwater for irrigating agricultural crops due to a progressively declining water supply will exert significant downward pressure on the economy of the region. The reduced agricultural output will be reflected throughout the region in terms of population, employment and gross output of non-agricultural sectors. The declining groundwater supply affects costs of providing community services. Of particular significance is the expected effect on smaller communities (less than 5,000) where rather dramatic increases in costs of community services are indicated. The structure of the Northern High Plains economy has been quantified. Data have been developed relative to expected changes in population, employment, per capita disposable income and agriculture and non-agricultural output. This provides information to planners in developing policy for regional development. Models are provided for estimating the impact of alternative policies such as water importation or encouragement toward rapid growth in specific industries.

2D. Agronomy and Horticulture

N76-25629/8GA PC$6.75/MF$3.00
Colorado State Univ., Fort Collins. Dept. of Earth Resources.
Extracting Scene Feature Vectors Through Modeling, Volume 3.
Final Report.
J. K. Berry, and J. A. Smith. Apr 76, 174p NASA-CR-147742
Contract NAS9-14467

Descriptors: Landsat satellites, Pattern recognition, Atmospheric models, Crop growth, *Crop identification, Divergence, Wheat.
Identifiers: Remote sensing, Finney County(Kansas), Farm crops, Wheat plants, Kansas.

For abstract, see STAR 1416

PB-254 586-T/GA PC$3.50/MF$3.00
Environmental Protection Agency, Research Triangle Park, N.C. Translation Services Section.
Ways of Increasing the Gas Resistance of Plants (Puti Povysheniya Gazostoikosti Rastenii),
G. M. Ilkun, V. V. Pankratev, S. A. Tarasenko, A. S. Mironova, and L. A. Mikhailenko. 1967, 17p EPA-TR-76-189
Trans. of Puti Povysheniya Intensivnosti i Produktivnosti Fotosinteza; Respublikanskii Mezhvedomstvennyi (USSR) n2 p124-133 1967.

Descriptors: *Plants(Botany), *Toxicity, Plant physiology, Vegetation, Air pollution, Gases, Dust, Aerosols, Toxic tolerances, USSR, Translations.
Identifiers: *Air pollution effects(Plants), Toxic substances.

Pollution of the atmosphere with various gases, dust, and aerosols, which are copiously discharged by industrial enterprises, creates extremely unfavorable conditions for planting greenery in their territory and for raising agricultural crops. Under these conditions, plants suffer a sharp loss in their productivity and often die. The harmful effect of gas in the same concentration varies, depending upon the species of plant, weather conditions, and the age of the leaf. There are species, as well as specific individuals within a single species, that are distinguished by increased gas resistance. Among the many problems related to the gas resistance of plants, attention is given to clarifying the causes of differing degrees of resistance of individual species and of individuals to the toxic gases, to their harmless concentrations, and to their effect on photosynthetic activity.

PB-254 764/4GA PC$5.00/MF$3.00
Department of Agriculture, Washington, D.C.
Basic Problems of the Soil Cutting Process Using Tillage Implements (Podstawowe Problemy Mechaniki Procesu Skrawania Gruntow Narzedziami Rolniczymi),
Andrzej Zdanowicz. 1976, 82p TT-74-54039
Trans. of Roczniki Nauk Rolniczych (Poland) Ser D v136 p1-86 1972, by A. Skup. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Topsoil, *Cultivation, Stresses, Soils, Deformation, Shear stress, Equations, Cutting, Soil mechanics, Friction factor, Strength, Poland, Translations.
Identifiers: Soil cutting resistance, Tillage tools.

Contents: Deficiencies of the current methods of calculation of the soil cutting strength; Review of the current empirical methods of calculation of the soil cutting strength; Discussion of the fundamental assumptions relative to stresses in soil and its deformations; Two principal rules concerning the soil cutting process; The available furrow slice deformation theories; The values of the shear angle and correlation of the wedge principle with the passive earth pressure principle; Discussion of the available theories of the furrow-slice deformation; A novel approach to the furrow-slice deformation theory.

PB-255 001/9GA PC$3.50/MF$3.00
Purdue Univ., Lafayette, Ind. Joint Highway Research Project.
An Evaluation of Several Mulch Materials on Landscape Plant Growth, Weed Control, Soil Temperature and Soil Moisture.
Interim rept.,
P. L. Carpenter. 30 Jul 75, 25p JHRP-75-14
Prepared in cooperation with Indiana State Highway Commission, Indianapolis and Federal Highway Administration, Washington, D.C. Report on Development of Techniques for Plant Establishment on the Roadside.

Descriptors: *Weed control, *Mulches, *Landscaping, Plant growth, Soil water, Soils, Temperature, Highways, Effectiveness, Evaluation.

The effectiveness of various materials as mulches for landscape sites was evaluated. Factors considered were weed control, effect on growth of landscape plants, and soil en-

vironment modification. The latter included measurements of soil temperatures and soil moistures. Mulches investigated were Douglas fir bark chips (2 inches dia), shredded hard wood bark, shredded scrap from rubber tires, and stone approximately 1.5 inches in diameter. Best weed control over a 2 year period was obtained with the Douglas fir bark chips with 2 inches mulch of shredded rubber tires being nearly as good. The best plant growth was obtained when the plants were mulched. Cotoneaster grew better when mulched with Douglas fir bark than any other mulch treatment except 2 inches of shredded rubber tires. This is probably due to a reduction in weed competition. The effect on growth of junipers was less pronounced.

2F. Forestry

N76-25827/8GA PC$4.50/MF$3.00
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
A Forestry Application Simulation of Man-Machine Techniques for Analyzing Remotely Sensed Data.
J. Berkebile, J. Russell, and B. Lube. 7 May 76, 75p NASA-CR-147663, LARS-IN-012376
Contract NAS9-14016

Descriptors: *Forest management, *Pattern recognition, *Remote sensors, Computer techniques, Man machine systems, Multispectral band scanners, Numerical analysis, Scene analysis.

For abstract, see STAR 1416

PB-255 063/8GA PC$4.00/MF$3.00
Eisenhower Consortium for Western Environmental Forestry Research, Fort Collins, Colo.
Aspen Stands as Wildfire Fuel Breaks,
Gilbert H. Fechner, and Jack S. Barrows. Jun 76, 32p Eisenhower Consortium Bull-4
Prepared by Colorado State Univ., Fort Collins. Coll. of Forestry and Natural Resources.

Descriptors: *Forest fires, *Forest trees, Combustion, Magnitude, Spreading, Plant growth, Plant reproduction, Efficiency, Utilization, Fire protection.
Identifiers: *Populus tremuloides, Fuel breaks, Wildfires.

Fire ignition rates in quaking aspen stands are less than half those for all other cover types in Colorado. These stands do not support rapidly spreading or intense fires due to their low burning index and spread component. Crown fires drop to the ground when they reach quaking aspen stands, and prior to autumn leaf fall, fire spreads only a short distance into the stands. Quaking aspen propagation can be encouraged in the field by severing roots from the main stem; under suitable temperature and light intensity, this stimulates abundant sucker formation. Artificially, quaking aspen can best be propagated through the use of root cuttings.

PB-255 820/3GA PC$3.50/MF$3.00
North Central Forest Experiment Station, St. Paul, Minn.
An Assessment of Three Measures of Long Term Moisture Deficiency Before Critical Fire Periods.
Forest Service research paper,
Donald A. Haines, Von J. Johnson, and William A. Main. 1976, 19p FSRP-NC-131

Descriptors: *Forest fires, *Droughts, Moisture content, Forest land, Indexes(Ratios), Weather, Forestry, United States.
Identifiers: North Central Region(United States), Northeast Region(United States), *Wildfires.

Values of the Palmer drought index, the Keetch-Byram drought index, and a buildup index are calculated for 26 critical fire situations in the North-Central and North-Eastern States. The paper examines the response characteristics of these indexes, representative of different moisture regimes, relative to fire danger.

3. ASTRONOMY AND ASTROPHYSICS

3B. Astrophysics

AD-A027 512/3GA PC$4.00/MF$3.00
Brandeis Univ Waltham Mass Dept of Physics
Solar Atmospheric Dynamics,
R. F. Stein, and S. H. Hsieh. Jan 76, 30p
Scientific-1, AFCRL-TR-76-0034
Contract F19628-75-C-0013

Descriptors: *Solar atmosphere, *Solar corona, Solar physics, *Chromosphere, Gravity waves, Magnetohydrodynamic waves, Vector analysis, Computations, Excitation, Propagation, Wavelengths, Horizontal orientation, Nonlinear propagation analyses, Atmospheric physics.

This study, aimed at calculating the heating of the solar chromosphere and corona, started with the analysis of magneto-acoustic-gravity wave vector surfaces. To permit non-linear calculation of the excitation and propagation of these waves the equations of motion were written for an imposed horizontal structure -- namely six waves of the same wavelength propagating in an hexagonal pattern. (Author)

N76-25800/3GA PC$3.50/MF$3.00
Cornell Univ., Ithaca, N.Y. Center for Radiophysics and Space Research.
Exobiology and the Origin of Life.
Annual Status Report, 1 Jul. 1975 - 30 Jun. 1976.
C. Sagan, and B. N. Khare. May 76, 12p NASA-CR-148177, CRSR-637
Contract NGR-33-010-101

Descriptors: *Exobiology, *Extraterrestrial life, Jupiter atmosphere, Mars (Planet), Viking mars program.

For abstract, see STAR 1416

N76-25928/2GA PC$4.00/MF$3.00
Kanner(Leo) Associates, Redwood City, Calif.
Particle Creation in the Vortex Cosmological Model.
V. N. Lukash, I. D. Novikov, and A. A. Starobinskiy. Jun 76, 37p NASA-TT-F-17048, PR-233
Contract NASW-2790
Tran-Transl. into English from Moscow Inst. Of Space Res. Report PR-233, 1975.

Descriptors: *Cosmology, *Galactic rotation, *Gravitons, *Vortices, Astronomical models, Astrophysics, Galactic evolution, Rotating matter.
Identifiers: Translations, USSR.

For abstract, see STAR 1416

N76-26054/8GA PC$3.50/MF$3.00
Transemantics, Inc., Washington, D.C.
On the Possible Connection Between the Optical Variability and Radio Properties of Quasar-Like Objects.
B. V. Komberg. Jun 76, 20p NASA-TT-F-17054, PR-252
Contract NASW-2792
Tran-Transl. into English from Moscow Inst. Of Space Res. Report PR-252, 1975.

Descriptors: Luminescence, *Radio emission, *Radio sources (Astronomy), *Variability, Pulsars, Quasars, Radio astronomy.
Identifiers: Translations, USSR.

For abstract, see STAR 1416

N76-26056/1GA PC$16.25/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
X-Ray Binaries.
1976, 679p NASA-SP-389
Conf-Proc. Of a Symp. Held at Greenbelt, MD., 20-22 Oct. 1975.

Descriptors: *Binary stars, *Conferences, *X ray sources, Centaurus constellation, Cygnus constellation, Hercules nova, Satellite observation, Stellar radiation, X ray spectroscopy.
Identifiers: *X ray stars.

For abstract, see STAR 1416

N76-26125/4GA PC$6.00/MF$3.00
Saint Louis Univ., Mo. Dept. of Earth and Atmospheric Sciences.
Effective Mie-Scattering and CO2 Absorption in the Dust-Laden Martian Atmosphere and its Impact on Radiative-Convective Temperature Changes in the Lower Scale Heights.
Final Report, Dec. 1974 - Mar. 1976.
A. J. Pallmann. Mar 76, 134p NASA-CR-148202, PLATMOS-10
Contract NGR-26-006-042

Descriptors: *Atmospheric attenuation, *Atmospheric temperature, *Carbon dioxide, *Mars atmosphere, *Mie scattering, *Molecular absorption, Computerized simulation, Dust, Heat transfer, Infrared radiometers, Mathematical models, Planetary surfaces, Radio occultation, Spectrum analysis.

For abstract, see STAR 1416

N76-26126/2GA PC$4.50/MF$3.00
Cornell Univ., Ithaca, N.Y. Center for Radiophysics and Space Research.
Particles, Environments and Possible Ecologies in the Jovian Atmosphere.
C. Sagan, and E. E. Salpeter. May 76, 69p NASA-CR-148170, CRSR-617-REV
Contracts NGR-33-010-101, NGR-33-010-082
Misc-Revised.

Descriptors: *Atmospheric models, *Ecology, *Jupiter atmosphere, *Particles, Atmospheric chemistry, Atmospheric composition, Turbulent diffusion.

For abstract, see STAR 1416

N76-26127/0GA PC$4.00/MF$3.00
Cornell Univ., Ithaca, N.Y. Center for Radiophysics and Space Research.
Electrical Properties of APOLLO 17 Rock and Soil Samples and a Summary of the Electrical Properties of Lunar Material at 450 Mhz Frequency.
T. Gold, E. Bilson, and R. L. Baron. Apr 76, 26p NASA-CR-148171, CRSR-633
Contract NGL-33-010-137
Subm-Submitted for Publication. Conf-Presented at the 7TH Lunar Sci. Conf.

Descriptors: *Apollo 17 flight, *Electrical properties, *Lunar rocks, Lunar soil, Radar detection, Transition metals.

For abstract, see STAR 1416

N76-26128/8GA PC$3.50/MF$3.00
Cornell Univ., Ithaca, N.Y. Planetary Studies Lab.
On the Temperature Dependence of Possible 8S Infrared Bands in Planetary Atmospheres.
B. N. Khare, and C. Sagan. 22 Mar 76, 12p NASA-CR-148172, CRSR-632

Contract NGR-33-010-101

Descriptors: *Infrared spectra, *Planetary atmospheres, *Spectral bands, *Temperature effects, Atmospheric composition, Chemical composition, Sulfur.

For abstract, see STAR 1416

N76-26129/6GA PC$3.50/MF$3.00
Cornell Univ., Ithaca, N.Y. Planetary Studies Lab.
Interdisciplinary Investigations of Comparative Planetology.
Annual Status Report, 1 Jul. 1975 - 30 Jun. 1976.
C. Sagan. 15 Apr 76, 19p NASA-CR-148175, CRSR-636
Contract NGR-33-010-220

Descriptors: *Mars (Planet), *Planetology, *Venus (Planet), Abstracts, Canals, Mars atmosphere, Mars surface, Natural satellites.

For abstract, see STAR 1416

N76-26131/2GA PC$5.00
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
A Solar Flare Bibliography for 1973 Through 1975.
J. P. Mcguire. 15 Jun 76, 90p NASA-TM-X-73312

Descriptors: *Bibliographies, *Solar flares, Data reduction, Ground operational support system, Skylab program, Solar corona, Solar physics, Solar radiation.

For abstract, see STAR 1416

N76-26132/9GA PC$3.50/MF$3.00
Maryland Univ., College Park. Dept. of Physics and Astronomy.
Time Dispersion of Energetic Solar Particles, Unexpected Velocity and Species Dependence.
J. J. Gallagher, D. Hovestadt, B. Klecker, G. Gloeckler, and C. Y. Fan. May 76, 15p NASA-CR-148143, TR-76-114
Contracts NAS5-11062, NGR-21-002-316

Descriptors: *Heavy ions, *Solar corpuscular radiation, *Solar flares, Carbon, Energy spectra, Helium, Ion charge, Iron, Oxygen, Particle flux density, Time dependence, Velocity distribution.

For abstract, see STAR 1416

N76-26133/8GA PC$3.50/MF$3.00
Maryland Univ., College Park.
A Direct Measurement of the Charge States of Energetic Iron Emitted by the Sun.
G. Gloeckler, R. K. Sciambi, C. Y. Fan, and D. Hovestadt. May 76, 17p NASA-CR-148144, TR-76-113
Contracts NAS5-11063, NGR-21-002-224

Descriptors: *Charged particles, *Iron, *Solar radiation, Ionization, Solar flares, Solar wind.

For abstract, see STAR 1416

N76-26136/1GA PC$3.50/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SAS-2 gamma-Ray Observations of PSR 1747-46.
D. J. Thompson, C. E. Fichtel, D. A. Kniffen, R. C. Lamb, and H. B. Oegelman. May 76, 12p NASA-TM-X-71121, X-662-76-94
Subm-Submitted for Publication.

Descriptors: *Gamma rays, *Pulsars, Poisson density functions, Radio astronomy, Radio sources (Astronomy).

For abstract, see STAR 1416

N76-26138/7GA PC$3.50/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Prediction of the Diffuse Far Infrared Flux from the Galactic Plane.
G. G. Fazio, and F. W. Stecker. May 76, 17p NASA-TM-X-71125, X-602-76-107
Subm-Submitted for Publication.

Descriptors: *Far infrared radiation, *Galactic radiation, Cosmic dust, Galactic structure, Interstellar gas.

For abstract, see STAR 1416

N76-26139/5GA PC$4.00/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Energy Spectra of Cosmic Ray Nuclei: 4Z26 and .3E2 Gev/Amu.
R. C. Maehl, J. F. Ormes, A. J. Fisher, and F. A. Hagen. Jun 76, 45p NASA-TM-X-71133, X-661-76-132
Contract NGR-21-002-316

Descriptors: *Cerenkov counters, *Chemical composition, *Cosmic rays, *Energy spectra, Charge distribution, Nuclei (Nuclear physics), Primary cosmic rays, Secondary cosmic rays.

For abstract, see STAR 1416

PB-254 871/7GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
The Solar XUV Spectrum of He II.
Final rept.,
J. L. Linsky, D. L. Glackin, R. D. Chapman, W. M. Neupert, and R. J. Thomas. 16 Jun 75, 13p
Grant NGL-06-003-057
Prepared in cooperation with Joint Inst. for Lab. Astrophysics, Boulder, Colo. Pub. in Astrophysical Jnl. 203, n2 p509-520, 15 Jan 76.

Descriptors: *Solar spectrum, *Helium, Gas ionization, Solar corona, Solar flares, Ultraviolet spectra, Chromosphere.
Identifiers: Reprints, OSO-7 satellite.

OSO-7 observations of the first five Lyman lines and the Lyman continuum of He II are given for the quiet Sun, a coronal hole, prominences, filaments, and the 7 August 1972 flare. These data are calibrated and given in specific intensity units together with color and brightness temperatures for the He II continuum. It was found that He II is overionized in all features except the flare and that the continuum is formed at temperatures near 14,000K. The He II - He III ionization equilibrium appears to be dominated by photoionizations and radiative recombinations. Schematic calculations for realistic chromosphere and transition region models can account for the observed intensities of L beta - L epsilon, the Lyman continuum, and its color temperature. To account for the intensity of L alpha either an implausible 100 km plateau at temperatures near 80,000K is needed or, more likely, the incorporation of diffusion-enhanced collisional excitation into the models.

PB-255 188/5GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Properties of the Chromosphere-Corona Transition Region in Capella.
Final rept.,
B. M. Haisch, and J. L. Linsky. 10 Nov 75, 5p
Grant NGL-06-003-057
Prepared in cooperation with Joint Inst. for Lab. Astrophysics, Boulder, Colo. Pub. in Astrophysical Jnl., 205 N1 L39-42, 1 Apr 76.

Descriptors: *Chromosphere, *Solar corona, *Stars, Spectroscopic analysis, Solar spectrum, Ultraviolet spectroscopy, Temperature, Special relativity, Line spectra, Energy dissipation.
Identifiers: Reprints, *Capella.

Analysis of recent ultraviolet observations of the Capella binary system (alpha Aur) indicates a dense, geometrically narrow chromosphere-corona transition region in the Capella system primary (G5 III) similar in many respects to a solar active region. An examination of the coronal energy balance, together with the coronal base pressure derived from the line fluxes, predicts a corona with a mean temperature of 1.2 time 10 to the 6th power K and a large stellar wind consistent with observations.

PB-255 199/2GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
High-Resolution Profiles of the Diffuse Interstellar Feature at 5780 A.
Final rept.,
B. D. Savage. 23 Jul 75, 14p
Prepared in cooperation with Joint Inst. for Lab. Astrophysics, Boulder, Colo., and Wisconsin Univ., Madison. Pub. in Astrophysical Jnl. 205, n1 p122-135, 1 Apr 76.

Descriptors: *Interstellar matter, Visible spectrum, Dissociation, Main sequence stars, Line spectra.
Identifiers: Reprints, Autoionization.

High-resolution profiles were obtained of the diffuse interstellar feature at 5780 A in 18 heavily reddened stars with the Wisconsin echelle spectrograph at the Cassegrain focus of the Mayall 4 m telescope. This feature is, in all cases, asymmetrical with its steep side being toward the blue. It is concluded that a careful study of the profiles of the narrow diffuse interstellar features may provide interesting information on the internal temperatures and geometrical characteristics of interstellar particles.

PB-255 228/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
A New Interstellar Line: The 51-40 (E2) Transition in Methyl Alcohol.
Final rept.,
B. Zuckerman, B. E. Turner, D. R. Johnson, F. Palmer, and M. Morris. 1 Nov 72, 7p
Pub. in Astrophysical Jnl., v177 n3 p601-607, 1 Nov 72.

Descriptors: *Interplanetary medium, *Methyl alcohol, *Extraterrestrial radio waves, Emission spectra, Radio astronomy, Molecular energy levels.
Identifiers: Reprints, *Sgr B2 radio source.

An emission line has been detected at 84.5 GHz in the direction of the radio continuum source Sgr. B2. The new line frequency has been found to coincide with a laboratory measurment of the 5 sub 1 goes to 4 sub 0 (E sub 2) transition of methyl alcohol (CH3OH). Additional searches for NH2CN, HCP, CH3Cl, ClCN, FeO, HC3HO, and NH2HCO were carried out in the 80-92-GHz region without success.

3C. Celestial Mechanics

N76-26130/4GA PC$5.00/MF$3.00
Transcmantics, Inc., Washington, D.C.
Orbital Elements of 45 Meteorites: An Atlas.
A. N. Simonenko. Jun 76, 95p NASA-TT-F-16464
Contract NASW-2792

Tran-Transl. Into English of the Book "Elementy Orbit 45 Meteoritov. Atlas" Moscow, Nauka Press, 1975 p 1-68.

Descriptors: *Meteorites, *Orbital elements, *Tables (Data), Atmospheric entry, Descent trajectories, Orbital velocity, Trajectory analysis.
Identifiers: Translations, USSR.

For abstract, see STAR 1416

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-A027 155/1GA PC$4.50/MF$3.00
Avco Everett Research Lab Inc Everett Mass
Turbulence Characterization and Control.
Final technical rept. 1 Feb-15 Oct 75,
M. G. Miller, P. L. Zieske, and G. Dryden. Jun 76, 56p RADC-TR-76-189
Contract F30602-75-C-0012, ARPA Order-2646

Descriptors: *Atmospheric refraction, *Turbulence, *Meteorological instruments, Atmospheric physics, Temperature, Computer programs, Data reduction, Optical data, Monitors, Photometers, Acoustic equipment, Micrometeorology, Refractive index, Meteorological data, Hawaii.
Identifiers: Seeing monitor.

This report covers activities relative to the characterization of the turbulent environment at the ARPA Maui Observation Station. Three areas are discussed. The first deals with the deployment of various instrumental systems to be used in the experimental program. These include micrometeorological sensors, a computer data processing system, and acoustic Sounder, the NOAA Star Sensor and the Hughes Seeing Monitor which are all presently operational.

AD-A027 201/3GA PC$3.50/MF$3.00
General Electric Co Santa Barbara Calif Dasiac
Reaction Rate Data. Number 55.
Mar 76, 17p
Contract DNA001-75-C-0023
See also report dated Sep 75, AD-A019 095.

Descriptors: *Reaction kinetics, *Atmospheric chemistry, *Aeronomy, Upper atmosphere, Abstracts, Nitrogen oxides, Particle collisions, Infrared radiation, Scientific research, Ions, D region, Ionosphere, Recombination reactions, Electrons, Nuclear explosions, Twilight, Aluminum compounds, Ozone, Nitrogen, Oxygen, Thermochemistry.
Identifiers: Electron molecule interactions, Ion molecule interactions, Metal oxides, Reaction rates, X ray analysis.

Summaries of research on atmospheric chemistry and physics are presented. Reaction kinetics, atomic and molecular physical processes, and thermochemistry related to the upper atmosphere are included.

AD-A027 289/0GA PC$3.50/MF$3.00
General Electric Co Santa Barbara Calif Dasiac
Reaction Rate Data. Number 56.
Apr 76, 19p
Contract DNA001-75-C-0023
See also report dated Mar 76, AD-A027 201.

Descriptors: *Reaction kinetics, *Atmospheric chemistry, *Aeronomy, Particle collisions, Ions, Thermochemistry, Deionization, Upper atmosphere, Molecular energy levels, Photochemical reactions, Infrared spectroscopy, Aluminum compounds, Oxides, Ozone, Oxygen, X ray absorption analysis, Excitation, D region, Abstracts, Gas ionization, Recombination reactions, Emission spectroscopy.
Identifiers: Negative ions, Positive ions, Ion molecule interactions, Metal oxides.

The report consists of 3 parts. Part 1, DNA-sponsored research, has the following major headings: Reaction rates critical to propagation; Theoretical investigations of ionizing mechanism in the upper atmosphere; Atomic and molecular physics of IR emissions; Part 2 contains abstracts of relevant reports. Part 3 discusses non-DNA-sponsored research.

AD-A027 267/1GA PC$4.50/MF$3.00
Lockheed Missiles and Space Co Inc Palo Alto Calif Palo Alto Research Lab
Ionospheric Effects Resulting from Precipitating Electrons at Mid and High Latitudes.
Final rept. 1 Nov 74-30 Jan 76,
J. B. Cladis, W. E. Francis, G. T. Davidson, and M. Walt. 30 Jan 76, 58p LMSC/D500513, DNA-3884F
Contract DNA001-75-C-0139

Descriptors: *Ionospheric disturbances, *Van Allen radiation belt, *Electron flux, Electron scattering, High latitudes, Low energy, Computer programs, Machine coding, Computations, Nuclear explosions, Explosion effects, Energy levels, Intensity, Atmospheric physics.
Identifiers: Aurora computer program, Mid latitudes.

The distributions of electrons resulting from pitch-angle diffusion due to both wave-particle interactions at high altitudes and binary collisions in the atmosphere have been determined. The results seem to be in agreement with available data, however wave fields which may be too high are required to fit the data. Some of the computational routines and cross sections used in the low-energy (1 eV to 500 eV) portion of the AURORA code have been improved. Processes occurring in the disturbed ionosphere other than collision and magnetic mirroring are inferred by comparing measurements of pitch-angle and energy distributions of electrons in the auroral zones with distributions computed with the AURORA code. (Author)

AD-A027 472/0GA PC$3.50/MF$3.00
National Bureau of Standards Washington D C Physical Chemistry Div
Cascade and Radiation Trapping Effects on Atmospheric Atomic Oxygen Emission Excited by Electron Impact,
P. S. Julienne , and J. Davis. 19 May 75, 9p
AFOSR-TR-76-0706
Availability: Pub. in Jnl. of Geophysical Research, v81 n7 p1397-1403, 1 Mar 76.

Descriptors: *Airglow, *Radiative capture cross sections, Atmospheric chemistry, Atmospheric physics, Oxygen, Aurorae, Cascade structures, Ultraviolet spectra, Excitation, Reprints.
Identifiers: Oxygen atoms, Electron irradiation.

No abstract available.

AD-A027 492/8GA PC$3.50/MF$3.00
Air Force Geophysics Lab Hanscom AFB Mass
Atmospheric Formation of NO from N2(A triplet sigma),
William Swider. 12 Mar 76, 4p Rept no. AFGL-TR-76-0157
Availability: Pub. in Geophysical Research Letters, v3 n6 p335-337 Jun 76.

Descriptors: *Atmospheric chemistry, *Nitrogen oxides, Nitrogen, Ionosphere, Airglow, Aurorae, Gas ionization, Day, Quiet, Solar X rays, Nitrous oxide, Reprints.
Identifiers: E region.

No abstract available.

AD-A027 624/8GA PC$3.50/MF$3.00
Office of Naval Research London (England)
Conference on Magnetospheric and Particle Physics 31 March - 2 April 1976,
Martin S. Harris. 2 Apr 76, 9p Rept no. ONRL-C-16-76

Descriptors: *Magnetosphere, *Particle spectra, Atmospheric physics, *Conferences, Particle size, Convection(Heat transfer), Stability, Physical properties.
Identifiers: Particle physics, Great Britain.

A conference on Magnetospheric and Particle Physics was held during 31 March - 2 April 1976 at the University of Sheffield sponsored by the Institute of Physics and the Royal Astronomical Society. The meeting covered the topics of reconnection and convection, structure and stability, particles and their origins, waves, fields, and pulsations in the magnetosphere. (Author)

AD-A027 628/7GA PC$3.50/MF$3.00
Ballistic Research Labs Aberdeen Proving Ground Md
Photodissociation of O2(+)(H2O).
Final rept.,
J. A. Vanderhoff, and R. A. Beyer. Jun 76, 18p Rept no. BRL-MR-2642

Descriptors: *Photodissociation, *Oxygen, Water, *Molecular ions, Cross sections, Atmospheric chemistry, Hydrates.
Identifiers: *Ion clusters.

The photodissociation cross section of the weakly bound positive ion cluster O2(+)(H2O) has been measured at 15 discrete energies between 1.833 and 2.727 eV. Measurements indicate the cross section increases smoothly from 0.6 to 6 x 10 to the -18th power sq cm over this energy range. These cross section values are the largest reported for a positive ion cluster of atmospheric importance.

AD-A027 629/5GA PC$3.50/MF$3.00
Ballistic Research Labs Aberdeen Proving Ground Md
The Ion Pair Production Rate due to Cosmic Rays.
Final rept.,
Melvin G. Heaps. Jun 76, 17p Rept no. BRL-MR-2641

Descriptors: Atmospheric physics, *Cos Stratosphere, Solar cycle, Ions, Atmospheric chemistry.
Identifiers: *Ion pair production rate, *Gas ionization, Galactic cosmic rays.

Galactic cosmic rays are the primary source of ionization in the stratosphere at all times and are the primary source in the lower mesosphere at night and during solar eclipses. The ion-pair production rate is given as a simple function of latitude and height (using pressure as the variable). The solar cycle variation may be included by the use of a simple sinusoidal variation. (Author)

AD-A027 637/6GA PC$3.50/MF$3.00
Air Force Geophysics Lab Hanscom AFB Mass
Calculated and Measured HF/VHF Absorption for the 2-5 November 1969 Solar Proton Event.
Environmental research papers,
William Swider, and Irving L. Chidsey, Jr. 9 Mar 76, 20p Rept nos. AFGL-TR-76-0053, AFGL-ERP-554

Descriptors: *Solar disturbances, *Electromagnetic radiation, *Ionospheric propagation, Protons, D region, Ionospheric disturbances, High frequency, Very high frequency, Ionization, Polar cap absorption, Computations, Accuracy, Electron density, Measurement, Solar physics.

Identifiers: Solar activity, Ionosphere.

Electromagnetic wave absorption was measured at several frequencies as a function of altitude for six rocket flights during the 2 to 5 November 1969 Solar Proton Event (SPE). Meaningful data were obtained at 36 MHz, 18 Mhz, and 9 MHz for four of these flights. These data and 30 MHz riometer data are shown to be in excellent accord with the calculated absorption. The agreement provides further support for the accuracy claimed for the electron concentrations that were measured simultaneously by means of dispersive phase techniques. It is stressed that uncertainties in the pressure are probably the largest error source. The electromagnetic wave absorption apparently was unaffected by the SPE-disturbed D-region except for the enhanced electron concentration. (Author)

E76-10409 PC$5.00/MF$3.00
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
Investigation of Earth's Albedo Using Skylab Data.
Final rept.,
Robert E. Turner. Jan 76, 82p ERIM-102200-20-F, NASA-CR-147445
Contract NAS9-13279

Descriptors: *Albedo, Aerosols, Climatology, *Atmospheric models, New Mexico, Lake Michigan, EREP, Skylab program, Radiative transfer, Reflectance, Multispectral band scanners.
Identifiers: *Earth atmosphere.

The author has identified the following significant results. Specific test sites in the White Sands, New Mexico and Lake Michigan areas were chosen because of their stability and known reflectances. Skylab S192 multispectral data and ERIM aircraft multispectral data were collected for these sites and were compared with results of atmospheric radiative transfer calculations in order to determine the aerosol content of the atmosphere. The spectral shape of the Skylab data compared quite favorably with the nearly simultaneous spectral character of the aircraft data. Although there were difficulties in the calibration of the S192 instrument which remain unresolved, interesting mathematical and physical relationships were discovered.

N76-25701/3GA PC$4.00/MF$3.00
Transemantics, Inc., Washington, D.C.
Electromagnetic Relationship of the Magnetosphere to the Ionosphere.
G. A. Vnuchkov, L. L. Vanyan, and A. S. Debabov. May 76, 29p NASA-TT-F-17035, PR-225
Contract NASW-2792
Tran-Transl. Into English from the Russian Report PR-225.

Descriptors: *Electromagnetic properties, *Ionosphere, *Magnetic disturbances, *Magnatosphere, Alignment, Atmospheric models, Electric current, High altitude environments.
Identifiers: Translations, USSR.

For abstract, see STAR 1416

N76-25702/1GA PC$3.50/MF$3.00
Agnew Tech-Tran, Inc., Woodland Hills, Calif.
Experiment to Determine the Concentration and Temperature of the Atomic Oxygen and Nitrogen in the Earth'S Upper Atmosphere from Measurement of the Ultraviolet Radiation Absorption During the APOLLO-Soyuz Joint Flight.
A. A. Vekhov, B. S. Kunashev, V. G. Kurt, V. A. Martynov, and V. A. Olshevskiy. Jun 76, 14p NASA-TT-F-17036, PR-230
Contract NASW-2789
Tran-Transl. Into English from Acad. Of Sci. Ussr, Inst. Of Space Res. (Moscow), PR-230, 1975 p 1-15.

Descriptors: *Apollo soyuz test project, *Nitrogen atoms, *Oxygen atoms, *Ultraviolet absorption, *Upper atmosphere, Absorption spectroscopy, Fluorescence, Resonance, Temperature measurement.
Identifiers: Translations, USSR.

For abstract, see STAR 1416

N76-25706/2GA PC$3.50/MF$3.00
Lockheed Electronics Co., Houston, Tex.
Water Vapor as an Atmospheric Attenuator to the Satellite-Observed Spectral Radience.
W. V. Abeele. Apr 76, 14p NASA-CR-147743, LEC-8478
Contract NAS9-12200

Descriptors: *Atmospheric attenuation, *Noaa satellites, *Spectral emission, *Water vapor, Meteorological satellites, Precipitation (Meteorology), Tables (Data), Temperature measurement.

For abstract, see STAR 1416

N76-25707/0GA PC$5.00/MF$3.00
Lockheed Electronics Co., Houston, Tex.
Accuracy of Satellite Derived Radiometric Data.
W. V. Abeele. Apr 76, 96p NASA-CR-147744, LEC-8545
Contract NAS9-12200

Descriptors: *Data reduction, *Error analysis, *Noaa satellites, *Radiometers, *Water vapor, Atmospheric attenuation, Atmospheric temperature, Meteorological satellites, Remote sensors.

For abstract, see STAR 1416

N76-25711/2GA PC$4.00/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Auroral Vector Electric Field and Particle Comparisons. 1: Pre-Midnight Convection Topology.
N. C. Maynard, D. S. Evans, B. Maehlum, and A. Egeland. May 76, 35p NASA-TM-X-71130, X-625-76-108
Subm-Submitted for Publication.

Descriptors: *Auroral arcs, *Electric fields, *Particle motion, Auroral spectroscopy, Convection currents, Correlation, Precipitation particle measurement.

For abstract, see STAR 1416

N76-25712/0GA PC$4.00/MF$3.00
Pennsylvania State Univ., University Park. Ionosphere Research Lab.
Ionosphere Research.
Semiannual Status Report, 1 Oct. 1975 - 31 Mar. 1976.
31 Mar 76, 38p NASA-CR-148200, PSU-IRL-SAR-76/1
Contract NGL-39-009-003

Descriptors: *Ionospheric composition, *Ionospheric propagation, Atmospheric chemistry, Computer programs, D region, E region, F region, Mass spectrometers, Planetary atmospheres.

For abstract, see STAR 1416

N76-25912/6GA PC$3.50/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
New Fine Structure Cooling Rate.
W. R. Hoegy. Mar 76, 19p NASA-TM-X-71117, X-621-76-64

Descriptors: *Electron energy, *Ionosphere, Cross sections, Electron impact, Electron transitions, Energy dissipation, Numerical analysis, Oxygen atoms, Rates (Per time).

For abstract, see STAR 1416

N76-26004/1GA PC$3.50/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Vlf-Emissions from Ring Current Electrons, An Interpretation of the Band of Missing Emissions.
K. Maeda, P. H. Smith, and R. R. Anderson. May 76, 17p NASA-TM-X-71135, X-602-76-106

Descriptors: *Ion emission, *Ring currents, Very low frequencies, Electric fields, Explorer satellites, Geomagnetism, Magnetic equator.
Identifiers: Explorer 45 satellite, Magnetic storms.

For abstract, see STAR 1416

N76-26135/3GA PC$3.50/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Dependence of the Charge Exchange Lifetimes on Mirror Latitude.
P. H. Smith, and N. K. Bewtra. Jun 76, 21p NASA-TM-X-71126, X-626-76-115
Subm-Submitted for Publication.

Descriptors: *Charge exchange, Dependence, *Ion currents, *Magnetic mirrors, *Plasma lifetime, Geomagnetic latitude, Hydrogen ions, Magnetic storms, Nuclear models, Spatial distribution.

For abstract, see STAR 1416

PAT-APPL-678 321/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
Method of Determining Ionospheric Reflection Height.
Patent Application,
Kurt Toman. Filed 19 Apr 76, 15p AD-D002 618/7
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Atmospheric sounding, Ionosphere, Reflection, Ionospheric propagation, Doppler effect, Height finding.
Identifiers: *Patent applications, PAT-CL-325-67.

The patent application describes a method for determining the ionospheric reflection height from doppler measurements made over an oblique radio transmission involving reflection of signals from a boundary. This method makes use of multi-hop reflections. The unknown motion of the reflection boundary is eliminated by taking the doppler-shift ratio for a pair of transmission hops. The height of the reflection boundary may be computed from this ratio for the particular distance that separates transmitter from receiver. The equations used follow from relatively simple geometrical considerations derived from spherical boundaries.

4B. Meteorology

AD-A027 252/6GA PC$4.50/MF$3.00
Naval Postgraduate School Monterey Calif
An Evaluation of the Harbor of Cebu Republic of the Philippines as a Typhoon Haven.
Master's thesis,
Benny Kyle Hassell. Mar 76, 74p

Descriptors: *Harbors, *Philippines, *Typhoons, *Tropical cyclones, Protection, Ships, Naval vessels, Theses.
Identifiers: *Cebu Harbor, Storm surges, Wind(Meteorology), Water waves.

This study is an evaluation of Cebu Harbor as a typhoon 'haven'. Characteristics of the harbor discussed include facilities available, wind and wave action, storm surge and the topographical effects on winds prior to an during passage of tropical cyclones. Problems to be considered if remaining in port and possible evasion procedures for ships sailing from the port are examined. The tracks of tropical cyclones from 1947-1974 for the western North Pacific were analyzed to determine the probability of threat to Cebu Harbor. Observations by the author and information obtained in conversations with port and harbor authorities are utilized in reaching conclusions. In general, the results indicate that Cebu Harbor is not a safe haven. Under threatening conditions, all fleet units capable of evasion at sea should sortie at the earliest possible moment. (Author)

AD-A027 255/9GA PC$4.00/MF$3.00
Naval Postgraduate School Monterey Calif
Spectrum Analysis of Easterly Waves in the Tropical Pacific during Two Contrasting Periods of Sea-Surface Temperature Anomalies.
Preliminary rept. Jul 75-Jul 76,
Chih-Pai Chang, and C. R. Miller, III. Jul 76, 47p Rept no. NPS-63Cj76071

Descriptors: *Marine meteorology, *Tropical regions, Meteorological data, *Ocean waves, Surface temperature, Pacific Ocean, Spectrum analysis, Radiosondes, Variations, Troposphere, Wind, Circulation, Vertical orientation.
Identifiers: *Sea surface temperature anomalies, Cumulus heating, *Air water interactions.

The structure and properties of the tropical easterly waves has been found to vary considerably between different regimes and time periods. This study investigates the possible roles played by the temporal and spatial sea-surface temperature (SST) variations on the waves. Time series of tropical western pacific radiosonde data during two contrasting eight-month periods of SST anomalies, May-December 1972, which has abnormally high SST in the central and eastern Pacific, and May-December 1973 which has below normal SST in the same region, are analyzed. In both periods, the waves have the same periodicity of 4-5 days and a lower tropospheric zonal wavelength on the order of 3300 km, but their vertical phase and amplitude distributions as well as the thermal structures are different. The results are discussed in terms of two possible influences the SST variations may have on the waves: 1) direct effect, the warmer SST represents stronger thermal control through cumulus heating; and 2) indirect effect, the variation of SST changes the large-scale mean wind circulation which, in turn, has a strong impact on the wave vertical structure and the relative importance of energy sources other than cumulus heating. Finally, a schematic model of these influences is proposed which may be applied to both the temporal and the spatial variations of SST. (Author)

AD-A027 379/7GA PC$7.50/MF$3.00
Calspan Corp Buffalo N Y
The Characteristics of Marine Fog Occurring off the Coast of Nova Scotia.
Annual summary rept. no. 4 (Part 1),
Eugene J. Mack, and Ulrich Katz. Jun 76, 189p Rept no. CALSPAN-CJ-5756-M-1
Contract N00019-75-C-0508
Report on Project Sea Fog. See also Part 2, AD-A027 380 and report dated Mar 75, AD-A018 958.

Descriptors: *Marine atmospheres, *Fog, North Atlantic Ocean, Coastal regions, Nova Scotia, Measurement, Profiles, Visibility, Temperature, Research ships, Charts, Graphs, Statistical data.
Identifiers: Sea fog project, Hayes vessel.

This report contains data describing the micrometeorological, microphysical and chemical characteristics of marine fogs occurring in the area off the southeast coast of Nova Scotia.

AD-A027 380/5GA PC$4.00/MF$3.00
Calspan Corp Buffalo N Y
Simulation of Marine Advection Fog with the Calspan Advection Fog Model Using Prognostic Equations for Turbulent Energy.
Annual summary rept. no. 4 (Part 2),
Eugene J. Mack, and C. William Rogers. Jun 76, 43p Rept no. CALSPAN-CJ-5756-M-2
Contract N00019-75-C-0508
Report on Project Sea Fog. See also Part 1, AD-A027 379.

Descriptors: *Marine atmospheres, *Fog, *Atmosphere models, North Atlantic Ocean, Coastal regions, Nova Scotia, Radiative transfer, Temperature, Visibility, Mathematical models, Computerized simulation, Computer programs, FORTRAN.
Identifiers: Sea fog project.

Partial contents:
The influence of radiative transfer on fog development;
The influence of a warming sea surface on the development of advection fog;
Observations of a marine advection fog;
Numerical simulations of fog formed by turbulent heat exchange with a cold sea surface and comparison with observations.

AD-A027 399/5GA PC$3.50/MF$3.00
Naval Postgraduate School Monterey Calif
The Numerical Solution of the Helmholtz Equation on a Sphere.
Final rept. Jan-Jun 75,
Frank D. Faulkner. Feb 76, 22p Rept no. NPS-53Fa76025

Descriptors: *Weather forecasting, *Numerical analysis, Partial differential equations, Computer applications, Computations.
Identifiers: *Helmholtz equation, *Numerical weather forecasting.

An iterative method is given for the numerical solution of the Helmholtz equation (del squared) u - hu = f on the surface of a sphere; h and f are assumed to be functions of position. An initial estimate is required; if none is available the routine sets u identically equal 0 initially. The iteration is in two stages. First the non-polar values are corrected by a fast direct solver, with the polar values held fixed; then the polar values are corrected. The routine is used in the Fleet Numerical Weather Central global numerical variational analysis program to solve for the surface pressure.

AD-A027 410/0GA PC$4.50/MF$3.00
Naval Environmental Prediction Research Facility Monterey Calif
Clearing Fog by Seeding with Charged Water Drops: A Numerical Study,
Paul M. Tag. May 76, 52p Rept no. NEPRF-Technical Paper-6-76

Descriptors: *Fog dispersal, Visibility, Seeding, Water, Drops, Concentration(Composition), Rates, Sizes(Dimensions), Mathematical models, Coalescence, Polarization.
Identifiers: Warm fog, Hygroscopic seeding.

A numerical study of the use of highly charged water drops to clear warm fog has been conducted. The polarization of neutral fog droplets and their capture by the charged drops is the mechanism studied. A multi-leveled microphysical model is used to investigate the degree of visibility improvement resulting from variations in seeding drop size and charge, the type of fog being seeded, and the concentration of seeding material. An evaluation of this technique is made by comparing model results to comparable numerical experiments of hygroscopic seeding, a technique that has been field tested on several occasions. (Author)

AD-A027 412/6GA PC$4.00/MF$3.00
Control Data Corp Minneapolis Minn Research Div
A Pilot Analysis of the Curvature of Extratropical Storms.
Final rept. Jun 75-Jan 76,
D. G. Dartt. 2 Jan 76, 50p NEPRF-TR-2-76 (CDC)
Contract N00228-75-C-2363
See also Rept. no. NEPRF-TR-11-75 (CDC) dated 2 Oct 75, AD-A022 650.

Descriptors: *Tropical cyclones, Meteorological satellites, *Hurricane tracking, Hurricanes, Curvature, Trajectories, Weather forecasting, Clouds, Photointerpretation keys, Intensity, Hyperbolas, Vortices, Remote detectors.
Identifiers: Center of curvature, Remote sensing

Curvature properties of satellite cloud patterns are examined for the purpose of defining indirect measures of intensity and motion of extratropical storms. The distribution of centers of curvature among concentric cloud bands near the storm center is used to objectively locate the center of the storm and to derive a parameter related to storm intensity. This intensity parameter is proportional to the radius and number of concentric cloud bands and appears useful for describing time variations of strength of the storm's circulation. A model hyperbolic spiral is also used to characterize the primary spiral cloud band of extratropical disturbances. The calculated intensity of the spiral appears useful for measuring the development of the storm as depicted by the 500 mb relative vorticity. The asymptote of the spiral may also be a reasonably good predictor of the direction of the following 12-hourly storm trajectory. Perhaps, the most promising application of the techniques is for remotely monitoring by satellite the strength of vortices over ocean regions. Previous efforts under the contract have been concerned with the application of the above techniques to tropical storms. The details of this study have been reported separately in an earlier report 'Objective Tropical Storm Parameters from Satellite Cloud Patterns.' An abstract of the first report is included as preface to this report. (Author)

AD-A027 457/1GA PC$4.00/MF$3.00
Air Force Environmental Technical Applications Center Scott AFB Ill
A Technique to Specify Liquid Water Content at a Point in the Atmosphere.
Final rept.,
Robert G. Feddes. 1 Jun 73, 41p Rept no. USAFETAC-6988

Descriptors: *Atmosphere models, *Cloud physics, Clouds, Moisture content, Meteorology, Computerized simulation, Computer programs.

The liquid water content (LWC) in clouds in a three dimensional reference system is an important input parameter for operational forecast models and for design problems of systems that operate in the atmosphere. The LWC can be calculated from the cloud's drop-size distribution. An accurate estimate of LWC/DSD depends upon knowing the cloud

type, air mass type, ambient temperature, cloud age, geographical locations, degree of saturation, and the general meteorological condition. Estimates of these parameters can be obtained from the global cloud analysis and the 10-level synoptic parameter analysis data bases which are produced by the Air-Force Global Weather Central. A percentage of the maximum LWC possible for precipitating and non-precipitating clouds in a layer times the percentage of cloud coverage yields the LWC for that volume.

AD-A027 459/7GA PC$11.00/MF$3.00
Air Weather Service Asheville N C
Revised Uniform Summary of Surface Weather Observations - Chiangmai, Thailand.
Final rept.
Dec 72, 422p

Descriptors: *Meteorological data, Weather, Wind direction, Wind velocity, Visibility, Cloud cover, Atmospheric temperature, Humidity, Haze, Fog, Rainfall, Thunderstorms, Thailand.
Identifiers: Chiangmai(Thailand).

Data report is comprised of a six part statistical summary of surface weather observations for Chiangmai, Thailand. The six parts are: (a) Weather Conditions and Atmospheric Phenomena, (b) Precipitation, Snowfall, and Snow Depth, (c) Surface Winds, (d) Ceiling Versus Visibility, Sky Cover, (e) Daily Max, Min, and Mean Temperature, Extreme Maximum and Minimum Temperature, Psychrometric-Day vs Wet Bulk Temperature, Mean and Standard Deviation-(Dry Bulb, Wet Bulb, and Dew Point, and Relative Humidity, and (f) Station Pressure and Sea Level Pressure.

AD-A027 491/0GA PC$3.50/MF$3.00
Air Force Geophysics Lab Hanscom AFB Mass
Progress in Precipitation Growth Measurements,
Robert M. Cunningham. 1976, 6p Rept no. AFGL-TR-76-0156
Availability: Pub. in World Meteorological Organization (WMO) Conf. on Weather Modification, Circular no. 2 p653-657 1976.

Descriptors: *Precipitation, *Atmospheric physics, Storms, Cyclones, Growth(General), Meteorological radar, Computations, Hydrometeors, Drops, Sizes(Dimensions), Distribution, Reprints.
Identifiers: *Ice formation, Particle size distribution.

Proper sampling of precipitating weather systems has always been difficult. The minute, infrequent direct particle sampling from rudimentary instrumentation has given only a snapshot of the particulate population. Broad coverage of the storm structure has been available from radar coverage, but conversion of the radar signal to the particulate population details, particularly in the case of snow and ice crystal clouds, has not been quantitative. New electro-optical devices now make it possible to gather copious data on particle distribution from aircraft. The results from measurements with the particulate probes developed by Knollenberg and flown in U.S. East Coast Cyclonic storms show how the particulate spectra change dramatically from narrow ice crystal spectra found at storm tops to bread snow spectra near the melting level. With the high powered SPANDAR radar at Wallops Island, Va, measurements of the radar reflectivity factor (Z) a short distance in front of the aircraft permitted comparison between two independent methods of obtaining Z. The analytical methods used are also described, including a discussion of the particular extrapolations used to adjust for the limited sample size of the airborne instruments as well as the equations used to convert from physical crystal size to particle mass.

AD-A027 532/1GA PC$4.00/MF$3.00
Hawaii Univ Honolulu Dept of Meteorology
Cross-Equatorial Interactions in the Development of a Winter Typhoon: Nancy 1970.
Technical paper,
Charles P. Guard. May 76, 50p UHMET-74-6, NEPRF-TP-4-76
Contract N00228-75-C-2045

Descriptors: *Typhoons, *Tropical cyclones, Storms, Atmospheric circulation, Anomalies, Winter, Seasonal variations, Pacific Ocean.
Identifiers: Typhoon Nancy, ESSA-0 satellite.

Although winter typhoons can be as intense and destructive as seasonable ones, little research has been devoted to these off-season tropical cyclones. This synoptic and dynamic study is of such a storm. Typhoon Nancy (19-27 Feb 70). It examines anomalies in the February 1970 circulation patterns over the Western Pacific and uses them to explain the formation and development of Nancy. Special emphasis is placed on the impact of cross-equatorial interactions during the storm's genesis.

AD-A027 533/9GA PC$4.50/MF$3.00
Naval Environmental Prediction Research Facility Monterey Calif
An Evaluation of the Harbor of Cebu, Republic of the Philippines, as a Typhoon Haven.
Technical paper,
B. K. Hassell. May 76, 74p Rept no. NEPRF-Technical Paper-3-76

Descriptors: *Typhoons, *Tropical cyclones, Surface navigation, Philippines, Paths, Tracks, Safety, Evasion, Assessment, Storms, Sea states, Sea traffic.
Identifiers: *Cebu Harbor, Evaluation.

The report is an evaluation of Cebu Harbor as a typhoon haven. Characteristics of the harbor discussed include facilities available, wind and wave action, storm surge and the topographical effects on winds prior to and during passage of tropical cyclones. Problems to be considered if remaining in port and possible evasion procedures for ships sailing from the port are examined.

AD-A027 573/5GA PC$4.50/MF$3.00
Naval Postgraduate School Monterey Calif
USNS Hayes Marine Fog Cruise; Preliminary Evaluation of Naval Postgraduate School Data.
Preliminary rept. Jul-Dec 75,
Gordon E. Schacher. 2 Apr 76, 69p Rept no. NPS-61Sq76041

Descriptors: *Fog, *Marine meteorology, *Atmospheric motion, Turbulent flow, Meteorological phenomena, Atmospheric temperature, Profiles, Air mass analysis, Research ships, Oceanographic ships.
Identifiers: Temperture profiles, North Atlantic Ocean, Meteorological instruments, Meteorological data.

This report summarizes the participation of the Naval Postgraduate School aboard the USNS Hayes on a marine fog cruise in the North Atlantic. The equipment which was installed aboard the ship and the types of measurements which were made are described. Tables of the mean data taken are presented as well as some preliminary evaluation of the data. (Author)

AD-A027 640/2GA PC$4.00/MF$3.00
Air Force Geophysics Lab Hanscom AFB Mass
Atlas of Probabilities of Surface Temperature Extremes: Part I. Northern Hemisphere.
Environmental research papers,
Paul Tattelman, and Arthur J. Kantor. 16 Apr 76, 35p Rept nos. AFGL-TR-76-0084, AFGL-ERP-557

Descriptors: *Surface temperature, *Maps, Climate, Northern Hemisphere, Periodic variations, Regression analysis, Probability, High temperature, Low temperature.
Identifiers: Extreme temperatures, Atlases, *Atmospheric temperature.

A method for calculating warm (cold) temperature extremes during the warmest (coldest) month of the year was developed. Regression analyses were performed for warm (cold) temperature versus an index calculated from a station's monthly mean temperature and mean daily range. Correlation for these regression lines ranges from 0.974 to 0.995. Warm and cold indices, calculated for approximately 2000 Northern Hemisphere stations, were plotted and analyzed. The resulting Northern Hemisphere maps of the 1-, 5-, and 10-percent warm temperatures, and the 1-, 5-, 10-, and 20-percent cold temperatures for the warmest (coldest) month are presented. (Author)

E76-10382 PC$5.50/MF$3.00
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
The Application of Satellite Data in the Determination of Ocean Temperatures and Cloud Characteristics and Statistics.
Final rept.,
Robert J. Curran, Vincent V. Salmonson, and William Shenk. 1975, 124p NASA-TM-X-72599
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Water temperature, Oceans, *Clouds(Meteorology), Skylab program, EREP, Statistical analysis, Multispectral band scanners, Spectrometers.
Identifiers: Ocean temperature, Image processing.

The author has identified the following significant results. The major shortcoming of the data was the loss of the infrared radiances from the S191 spectrometer. The cloud thermodynamic phase determination procedure was derived and tested with the data collected by the S192 multispectral scanner. Results of the test indicate a large fraction of the data could be classified thermodynamically. An added bonus was the inclusion of snow in the classification approach. The conclusion to be drawn from this portion of the effort is that in most cases considered ice clouds, liquid water droplet clouds, and snow fields can be spectroscopically separated to a high degree of accuracy.

E76-10403 PC$4.00/MF$3.00
Department of Industry, London (England).
Comparisons of Cloud Cover Evaluated from LANDSAT Imagery and Meteorological Stations Across the British Isles.
Quarterly progress rept. no. 3,
Eric C. Barrett, and Colin K. Grant. Jun 76, 47p NASA-CR-148216
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: *Cloud cover, *Great Britain, Rain, Mesometeorology, Earth resources program, High resolution, Human performance, Tables(Data).

The author has identified the following significant results. This stage of the study has confirmed the initial supposition that Landsat data could be analyzed to provide useful data on cloud amount, and that useful light would be thrown thereby on the performance of the ground observer of this aspect of the state of the sky. This study, in comparison with previous studies of a similar nature using data from

meteorological satellites, has benefited greatly from the much higher resolution data provided by Landsat. This has permitted consideration of not only the overall performance of the surface observer in estimating total cloud cover, but also his performance under different sky conditions.

NTIS/PS-76/0635/3GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Fog Prediction (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Guy E. Habercom, Jr. Aug 76, 139p

Descriptors: *Bibliographies, *Weather forecasting, *Fog, Weather observations, Meteorological instruments, Visibility, Infrared detection, Air water interactions, Atmospheric temperature, Synoptic meteorology.

Methods for predicting the possibility of fog formation and forecasting the eventual natural dissipation of fog are investigated. Worldwide climatic conditions conducive to the probability of fog in specific geographic areas are observed. (Contains 134 abstracts)

N76-25635/3GA PC$3.50/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
The Proper Weighting Function for Retrieving Temperatures from Satellite Measured Radiances.
A. Arking. Mar 76, 14p NASA-TM-X-71116, X-911-76-48

Descriptors: Measurement, Radiance, Satellites, *Weighting functions, *Atmospheric temperature, Linear programming, Reference atmospheres.
Identifiers: Remote sensing.

For abstract, see STAR 1416

N76-25734/4GA PC$4.50/MF$3.00
Environmental Research and Technology, Inc., Concord, Mass.
The Development of a Model to Infer Precipitation from Microwave Measurements.
M. G. Fowler, K. R. Hardy, and N. D. Sze. Apr 76, 66p NASA-CR-144761, P-1068
Contract NAS5-20888

Descriptors: *Microwave spectrometers, *Precipitation (Meteorology), Atmospheric models, Computation, Dynamic models, Microwave sensors, Radiometers, Rain gages.

For abstract, see STAR 1416

PB-255 812/7GA PC$12.75/MF$3.00
Colorado State Univ., Fort Collins. Coll. of Forestry and Natural Resources.
Ecological Impacts of Snowpack Augmentation in the San Juan Mountains of Colorado.
Final rept.,
Harold W. Steinhoff, and Jack D. Ives. 9 Mar 76, 508p CSU-FNR-7052-1
Contract DI-14-06-D-7052
Contribution to the United Nations Man and the Biosphere (MAB-6) Program.

Descriptors: *Snow cover, *Ecology, *Cloud seeding, *San Juan Mountains, Snow fall, Vegetation, Snowmelt, Climate, Tundra, Plant growth, Animals, Environmental impacts, Snowdrifts, Soil water, Forest land, Plant reproduction, Forest trees, Colorado.
Identifiers: Ecosystems, San Juan Ecology project.

The report condenses the evaluation of ecologic impacts due to varying snowpack in the San Juan Mountains. It is based on a study of the influence of a snowfall which is quite variable in both space and time. Direct observation of the effects of snowpack augmentation were not possible during the 5-year life of the San Juan Ecology Project, but the relationships established between ecosystem components and snow conditions allow the estimation of possible effects of long-term successful cloud seeding.

PB-255 227/1GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Preliminary Report on Electron Energy-Loss Measurements for CCIF3, CCI2F2, and CCI3F.
Final rept.,
D. L. Bushnell, Jr., R. H. Huebner, R. J. Celotta, and S. R. Mielczarek. 1975, 12p
Pub. in Argonne Natl. Lab. Report No. ANL-75-60, Part I, Radiological and Environmental Research Annual Report on Fundamental Molecular Physics and Chemistry, p7-17 (Argonne National Laboratory, Argonne, Ill., Jul 74-Jun 75).

Descriptors: *Ozone, *Stratosphere, Atmospheric chemistry, Concentration(Composition), Chlorine, Atoms, Energy dissipation, Chlorine organic compounds, Fluorohydrocarbons, Chemical reactions, Dissociation, Excitation, Atomic energy levels, Photons, Ultraviolet spectra.
Identifiers: *Freon, Chlorine atoms, Electron cross sections.

Currently, nation-wide research efforts are devoted to studying the possible ozone (O3) depletion in the stratosphere by the chemical action of chlorine atoms released from CCl2F2 or CCl3F upon absorption of ultraviolet radiation. Since electron-impact data taken in the forward scattering direction can be used to derive oscillator strengths and thus to yield apparent photoabsorption cross sections, the authors have carried out such an analysis for CCl2F2, CCl3F, and CClF3. The authors obtain oscillator-strength distributions between 5 and 20 eV and compare these to available photoabsorption data. Certain photoabsorption values agree very well with this electron-impact data, but other optical studies deviate in some spectral regions by as much as a factor of 5. Also, the electron energy-loss spectrum reveals electronic transitions previously undetected by photoabsorption.

PB-255 260/2GA PC$4.50/MF$3.00
Crow (Loren W.), Denver, Colo.
Airflow Study Related to EPA Field Monitoring Program, Denver Metropolitan Area. November, 1973.
Loren W. Crow. 1 Feb 74, 69p LWC-128
Prepared in cooperation with National Environmental Research Center, Research Triangle Park, N.C. Chemistry and Physics Lab.

Descriptors: *Atmospheric motion, *Air pollution, Transport properties, Combustion products, Plumes, Exhaust emissions, Airports, Graphic methods, Photographs, Monitoring, Concentration(Composition), Maps, Wind velocity, Meteorological balloons, Colorado.
Identifiers: *Denver(Colorado).

This report covers a summary of airflow patterns related to several air pollution episodes during November, 1973. The author assisted in selecting appropriate days for concentrated collection of air samples throughout the Denver metropolitan area. It was also his responsibility to coordinate the collection of pilot balloon (pibal) data at three locations on sampling days and to collect a photographic record from advantageous points. This airflow study adds to the body of data which has previously been collected during special study periods in the Denver metropolitan area.

PB-255 740/4GA Not available NTIS
Florida State Univ., Tallahassee. Geophysical Fluid Dynamics Inst.
Rotary Wind Spectra in a Sea Breeze Regime.
James J. O'Brien, and R. Dale Pillsbury. 1974, 8p Contrib-99, NSF/IDOE-76-31
Grants NSF-GX-33502, NSF-GA-29734
Prepared in cooperation with Oregon State Univ., Corvallis. School of Oceanography.
Pub. in Jnl. of Applied Meteorology, v13 n7 p820-825 Oct 74.

Descriptors: *Wind(Meteorology), *Wind velocity, Air water interactions, Sea breezes, Windward drift, Velocity measurement, Meteorological data, Weather observations.
Identifiers: Rotary spectrum technique, International Decade of Ocean Exploration, Reprints.

This report introduces a new descriptive technique used as a standard tool in physical oceanography called rotary spectrum. A brief explanation of the analysis technique is presented along with some sea-breeze rotary spectra.

PB-256 082/9GA PC$3.50/MF$3.00
National Weather Service, Silver Spring, Md. Techniques Development Lab.
Assimilation of Surface, Upper Air, and Grid-Point Data in the Objective Analysis Procedure for a Three-Dimensional Trajectory Model.
Technical memo.,
Ronald M. Reap. Feb 76, 22p NOAA-TM-NWS-TDL-59, NOAA-76040903

Descriptors: *Earth atmosphere, *Meteorological data, *Weather forecasting, *Atmospheric models, Moisture content, Atmospheric temperature, Dew point, Mathematical models, Radiosondes, Numerical analysis, Three dimensional flow.
Identifiers: Objective weather forecasting, Primitive equations.

The objective analysis procedure for the Techniques Development Laboratory (TDL) three-dimensional trajectory model was modified to include surface land and ship reports and initialized grid-point values from the National Meteorological Center (NMC) six-layer primitive equation (PE) model. In the new analysis procedure, upper air and PE data are assigned relative weights by means of a unique function which measures the asymmetry of the radiosonde station distribution at the initial position for each trajectory. As a result, weights applied to the upper air data are diminished with increasing station asymmetry. Conversely, weights assigned to the PE data are increased. The lapse-rate and decision-tree methods are used to assimilate surface data into the analysis procedure. A total of 25 test forecasts were made to evaluate the effect of the new analysis procedure on subsequent model forecasts.

PB-256 087/8GA PC$3.50/MF$3.00
National Weather Service, Kansas City, Mo. Central Region.
Hourly Cumulative Totals of Rainfall, Black Hills Flash Flood June 9-10, 1976.
Technical memo.,
Don K. Halligan, and Lawrence L. Longsdorf. Apr 76, 21p NOAA-TM-NWS-CR-59, NOAA-76042701

Descriptors: *Floods, *Rainfall intensity, *Storms, Weather observations, Precipitation(Meteorology), Surveys, Periodic variations, Rain, South Dakota.
Identifiers: Black Hills Region(South Dakota), *Flash floods.

The paper provides information about the June 1972 flood disaster in the Black Hills of South Dakota. The report gives hourly increments of the storm rainfall throughout the storm period.

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-A027 274/9GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Evolution of the Army Project Manager Development Program.
Student project rept.,
Ronald W. Little. Nov 75, 34p
Report on Program Management Course.

Descriptors: *Army research, *Management, Careers, Army procurement.
Identifiers: *Project management.

The purpose of this study is to determine where the Army is, at this time (Nov 1975), and where it is going as far as developing professional career programs in project management. It also looks into the promotion potential for PMDP participants in order to determine if opportunities for advancement are or will be equivalent with those of contemporaries in operational and especially command positions.

AD-A027 276/5GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
DOD/NASA Support Operations Management Interface.
Study project rept.,
Thomas E. Timothy. Nov 75, 56p
Report on Program Management Course.

Descriptors: *Manned space flight, *Management planning and control, *Logistics management, Logistics support, Costs.

The purpose of this study was to investigate the manner in which support operations have been provided from DOD resources to the NASA for manned space flight endeavors. Of particular interest was the investigation of the new Space Shuttle program. The approach used was to examine the historical documents of manned space flight through the recently concluded Apollo Soyuz mission. This investigation developed the extremely successful way in which support operations have been managed by the DOD. Additional research was carried into the Space Shuttle documentation for an insight into how this same type support might be supplied for that mission. This study points out how a well defined, operationally tested management interface is being allowed to deteriorate and perhaps be discarded for a program that appears to need it desperately.

AD-A027 287/2GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Productivity Measurement: A New Managerial Concept for the Military.
Study project rept.,
W Larry Shelby. Nov 75, 48p

Descriptors: *Productivity, Work measurement, Logistics management, Effectiveness, Army procurement, Management planning and control, Efficiency, Motivation, Manpower utilization, Resource management, Army budgets, Acquisition, Management training, Assessment, Performance, Standards.

The purpose of this study is to provide a thorough understanding of the productivity measurement concept and its application within Army logistical functions. A 'productivity cycle' is developed to illustrate three interdependent elements within the concept. Applications of the concept are then evaluated to include the materiel acquisition function. Several materiel acquisition functions are candidates for employing the productivity concept, and a potential effectiveness-efficiency approach is presented. The study recommends: further application of the concept in budget submissions; new training at schools to acquaint personnel with this managerial tool; and continued development and utilization in the materiel acquisition functions. This report provides a detailed narrative explanation of productivity measurement.

AD-A027 288/0GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Life Cycle Costing and the Effect of Ownership Costs.
Study project rept.,
William J. Schumacher. Nov 75, 36p

Descriptors: *Life cycle costs, *Cost estimates, Weapon systems, Acquisition, Operation, Logistics support, Manpower, Resource management, Military procurement, Maintenance management, Management information systems, Costs, Data bases, Standardization.
Identifiers: *Ownership costs.

The purpose of this study was to examine life cycle costing (LCC) and to determine the effect of ownership (i.e., operating and support) costs on the life cycle cost of a weapon system. Most of the discussion deals with the application of LCC to major system acquisition. This report focuses on the collecting and reporting of ownership costs as well as addressing problems encountered by DOD in collecting ownership cost data and in applying LCC. Despite the significant cost savings demonstrated by LCC procurements, its use has been limited because of the uncertainity of the legal validity of LCC; insufficient emphasis by DOD in training personnel; lack of a reporting system within DOD; and the increased work required in some LCC contracts. Utilizing LCC for estimating the total cost of a weapon system has had even less application because of the inconsistency of lie cycle cost estimates and a lack of cost data by weapon system. While progress has been made in improving cost estimates, collection of ownership costs by weapon system has moved slowly because of the multitude of data systems required and the lack of standard definitions of cost elements.

AD-A027 296/6GA PC$4.00/MF$3.00
Naval Postgraduate School Monterey Calif
Design Considerations for Implementing a Shipboard Computer Supported Command Management System.
Master's thesis,
Patrick Anthony Callahan. Jun 76, 50p

Descriptors: *Management information systems, *Minicomputers, Computer aided instruction, Man computer interface, Shipboard, Automation, Data bases, Microcomputers, Computer programs, Computer program documentation, Integrated systems, Theses.
Identifiers: *Command management system, *Computer software.

This report outlines an approach for the implementation of a shipboard computer supported management information system. The physical design specifications and design philosophy are investigated. The application of mini-computer technology applied to the shipboard environment is presented. Specific administrative functions are recommended for automation. (Author)

AD-A027 445/8GA MF$3.00
Assistant Secretary of the Navy (Research and Development) Washington D C
Department of the Navy RDT and E Management Guide.
1 Jan 75, 266p
Revision of report dated 1 Jul 69, AD-721 520.
Availability: Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402.

Descriptors: *Management planning and control, *Naval planning, *Research management, Naval operations, Department of Defense, Long range(Time), Test and evaluation, Guides.

The Department of the Navy RDT and E Management Guide was developed to aid both newcomers to RDT and E management and practicing journeymen. For newcomers the Guide provides the means for rapid orientation in the Department of the Navy system for managing its RDT and E effort. For practicing RDT and E managers the Guide is a quick source of general information and leads to directives containing detailed guidance.

AD-A027 552/9GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
DOD Participation in the Shuttle Program a Management Analysis.
Student project rept.,
James P. Baker. 12 May 75, 55p

Descriptors: *Research management, *Space shuttles, *Management planning and control, Cooperation, Department of Defense, Allocations, Systems engineering, Space stations, Air Force research, Air Force budgets, Resource management, History, Logistics support, Payload, Integrated systems, Missions, Costs.
Identifiers: Joint NASA DOD activities, National Aeronautics and space administration.

This study assesses the potential impact of DOD participation in the Space Shuttle Program upon future military space operations. Five key issues affecting DOD future Shuttle operations are: (1) Inadequate management interface between DOD/NASA; (2) DOD/USAF political considerations in the Shuttle support; (3) Inadequate USAF funding during early states of the program; (4) Inadequate integrated logistics support; and (5) Mission applications and payload integration problems. Each of these areas is discussed in detail in the report. The author concludes that lack of DOD commitment to the Shuttle Program, in which DOD is a major user, may cause DOD to be severely limited in its potential application of the system in the next decade.

AD-A027 576/1GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Flow of Procurement Funds in the Naval Air Systems Command.
Student project rept.,
Thomas Gibbons. May 75, 38p

Descriptors: *Naval budgets, *Resource management, Project personnel, Finance, Management planning and control, Navy, Naval procurement, Allocations, Effectiveness, Management information systems, Flow charting.
Identifiers: *Financial management, Program management, Funding, Naval Air Systems Command.

In the present austere fiscal environment it is essential that those responsible for administration of Department of Defense appropriations exercise stringent management control over the budget execution process in order to ensure that the maximum benefit is derived from every dollar. This study examines the budget

execution process for procurement funds administered by Program Managers in the Naval Air Systems Command. The report focuses on three distinct phases in the process; allocation, obligation and tracking. These phases consider respectively the flow of funds to the Program Manager, the spending flow of funds from the Program Manager and the flow of information concerning the status of funds back to the Program Manager. In each phase, the flow path, documentation, limitations and responsibilities are identified and examined.

AD-A027 584/2GA PC$4.50/MF$3.00
Construction Engineering Research Lab (Army) Champaign Ill
Construction Scheduling of AFCS Facilities Methodology Report.
Final rept.,
Seung J. Kim. Jul 76, 69p Rept no. CERL-TR-C-71

Descriptors: *Construction, *Scheduling, *Military operations, Military engineering, Military facilities, Theater level operations, Field army, Data processing, Military planning, Battalion level organizations, Brigade level organizations, Military commanders.

The report presents the results of the first phase of a research project to develop two scheduling programs: one for the Office of the Chief of Engineers (OCE) and the other for engineer units. The first phase of the study aims to establish procedural frameworks for the two programs. Several existing computer programs were analyzed to see if their scheduling features can be adapted to the proposed programs. Based on this analysis and guidance received from representatives of the Army Facilities Components System (AFCS) and the Army Engineer School, the study developed a procedural framework for the scheduling programs, specifically a Critical Path Method (CPM) based scheduling technique for the program to be used at OCE and a priority-based resource scheduling method for the one to be used by engineer battalions, groups, brigades, or commands.

AD-A027 610/5GA PC$4.00/MF$3.00
Institute for Water Resources (Army) Fort Belvoir Va
Contracting for Social Impact Assessment.
Final rept.,
Gene E. Willeke, and Carol A. Willeke. Jun 76, 46p Rept no. IWR-76-1

Descriptors: *Contract administration, *Social welfare, Water resources, Army planning, Civil engineering, Resource management, Army Corps of Engineers, Assessment, Perception(Psychology), Interpersonal relations, Engineers, Economics, Social sciences.
Identifiers: Social impact, Contractors, Social scientists.

This report discusses the problems associated with traditional contracting procedures when applied to new and challenging fields, such as the analysis of the social impacts of public works projects. The report, which draws upon recent experiences of Corps of Engineers planning procedures and contractor personnel, includes a general discussion of the typical contracting process utilized by the Corps in contracting for professional services, and chapters dealing with market development and contractor selection, development of scopes of work, and maintaining and integrating contract results with other planning activities. (Author)

AD-A027 656/8GA PC$3.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Reliability: Policy Versus Implementation.
Study project rept.,
George Tsuchida. May 75, 18p

Descriptors: *Systems management, *Reliability, Policies, Naval planning, Standards, Naval procurement, Weapon systems, Acquisition, Shipboard, Management planning and control, Naval operations, Military requirements, Trade off analyses, Decision making.
Identifiers: Program management.

The purpose of this study was to provide a better understanding and appreciation of the reliability management factors that influence a shipboard weapon system acquisition manager. The results of a Naval Material Command Reliability Improvements Study Group are summarized. This summary and the current Navy reliability policies were then used as a basis for interviewing seven acquisition managers, covering ten shipboard weapon system programs of the Naval Sea systems Command. Results of the interviews indicated two significant areas: (1) Inadequate reliability requirements in the Operational Requirement, and (2) Management judgment in tailoring the reliability requirements. This report should enable better management planning and implementation of reliability program requirements which must be integrated and balanced with other acquisition requirements during the early phases of a weapon system's life cycle.

AD-A027 677/4GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Configuration Control of Subcontractors: How Much Do We Need: (USAF).
Student project rept.,
Frederick G. Ten Hoor. May 75, 30p

Descriptors: *Contract administration, *Configuration management, Air Force procurement, Management planning and control, Project personnel, Systems management, Integrated systems, Information systems, Weapon systems, Acquisition.
Identifiers: Program management, Contractors, Subcontractors.

This study examines the complex problems associated with change control in the subcontract structure. The current policy as specified in DOD and Air Force directives is investigated to determine how the policies address the program manager, prime contractor and subcontractor relationships. Recent changes in subcontract management planning are analyzed along with the current approach to AFPRO surveillance. From the program manager's perspective, this study offers several recommendations for more effective change control without major changes in present directives. (Author)

AD-A027 679/0GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Use of Cost and Schedule Data by Program Managers Under C/SCSC.
Student project rept.,
Stephen Starch. May 75, 40p

Descriptors: *Management information systems, *Contract administration, *Data management, Specifications, Reports, Management planning and control, Cost analysis, Scheduling, Validation, Weapon systems, Acquisition, Systems management, Data bases, Statistical analysis.
Identifiers: Program management, Cost schedule control system criteria.

The Cost/Schedule Control System (C/SCS) Criteria are a performance specification applied to a contractor's management information system (MIS). The data produced by an MIS which complies with the C/SCSC must be specified by the program manager. Cumulative and incremental cost data are used by program managers in a variety of ways to assess program cost and schedule status, to forecast trends, and to identify problems. The author, found that there is a need for improved education in the C/SCSC and the analysis of cost and schedule data, and recommends that the Defense Systems Management School write a programmed textbook for self study of the subject. Other areas identified as possibilities for increased usefulness of cost and schedule data are: improved graphical display, the application of statistical analysis to forecasting, the use of intermediate completion points, and wider use of computers.

NTIS/PS-76/0823/9GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Management Games (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
David W. Grooms. Aug 76, 203p*
Supersedes NTIS/PS-75/598, and NTIS/PS-74/112.

Descriptors: *Bibliographies, *Management games, Gaming models, Game theory, Education, Military planning, Economics, Urban planning, Libraries, Water resources, Mathematical programming.

The citations present studies on the applications of game theory to the management process. Aids for management in education, military planning, economics, city planning, library systems, and water resources are included. (This updated bibliography contains 198 abstracts, 35 of which are new entries to the previous edition.)

PB-255 614/0GA PC$4.50/MF$3.00
Rutgers - The State Univ., New Brunswick, N.J.
Legislative Priorities for Policy Assistance.
Series rept. Mar 76,
Randy Huwa, Alan Rosenthal, R. G. Jones, Robert MacDougall, and William Wilken. Mar 76, 66p NSF/RA-760073

Descriptors: *Legislation, *Government policies, State government, Energy, Natural resources, Environmental impacts, Education, Economic development, States(United States).
Identifiers: State legislation, Federal policies.

The report represents a project designed to assist in structuring an agenda for the provision and distribution of federal policy assistance to legislatures in the state--an agenda that can serve to orient the National Science Foundation and other federal departments and agencies to state legislative needs in selected policy domains. It consists of four papers which provided the background material for workshop discussions at Eagleton's Tenth Annual State Legislator Conference. The four policy domains chosen for exploration are: energy, natural resources and the environment, education, and economic and physical development. A paper prepared on each of these areas focuses on the problems of the area and the state's activities. Each considers what legislatures appear to need and what the federal government in particular might provide. Two essays on legislator perspectives and legislative needs are also included. It is hoped that this volume will contribute to the formulation of an agenda of state legislative priorities for policy assistance.

5B. Documentation and Information Technology

AD-A027 186/6GA PC$5.50/MF$3.00
Frankford Arsenal Philadelphia Pa
Subject and Author Index of Unclassified Frankford Arsenal Technical Reports, Open Literature, and Patents Issued During March 1975 through February 1976.
12 Mar 76, 110p Rept no. FAP-310-5(76)

Supersedes Rept. No. FAP-310-5 (75) dated 21 Apr 75, AD-B003 948L.

Descriptors: *Army research, *Military facilities, *Bibliographies, Abstracts, Army Research Laboratories, Technology, Scientific research, Laboratory tests, Patents, Small arms, Small arms ammunition, Projectiles, Propellants, Chemical analysis.

This bibliography is a compilation of 7 technical research articles, 7 technical memorandum reports, 3 technical notes, 26 technical research reports, 9 technical test reports, and 29 patents, which were issued during March 1975 through February 1976. It is the intent of the library to issue this index at least yearly. (Author)

AD-A027 224/5GA PC$3.50/MF$3.00
Informatics Inc Rockville Md
SOVRaD - A Digest of Recent Soviet R and D Articles. Volume 2, Number 5, 1976,
Stuart Hibben, Lee Boylan, and J. Kourilo. May 76, 21p
Contract MDA903-76-C-0254, ARPA Order-3097

Descriptors: *Abstracts, *Reports, Hydroacoustics, Atmospheric physics, Optical detectors, Oceanography, Energy conversion, Lasers, Chemical lasers, Gamma rays, Electron beams, USSR.
Identifiers: Gamma lasers, Electron beam target study.

This is a collection of brief abstracts on miscellaneous topics from the current Soviet technical literature. The intent is to supply a quick look at items of possible interest, including topics not necessarily named in the DARPA interest profile, as a supplement to our reportage on specified topics. (Author)

AD-A027 240/1GA PC$5.50/MF$3.00
Naval Postgraduate School Monterey Calif
Public Works Department Maintenance Management Information System.
Master's thesis,
Wayne Edward Johnson, and Hilbert Dwayne Dean. Jun 76, 118p

Descriptors: *Management information systems, *Maintenance management, Naval shore facilities, Resource management, Planning, Theses, Maintenance, Computer applications, Costs.
Identifiers: Public works.

This thesis reviews the facilities maintenance management program as applied to naval shore activities, to assess and determine what maintenance management information is needed and provided at the Public Works Officer's level of management. The organizational hierarchy of the U.S. Navy, which serves as the budget path for the Operation and Maintenance, Navy (O and MN) appropriation is related to the hierarchies of management responsibilities and information systems. The authors conclude that the Public Works Officer is primarily an operational manager, that he needs to be able to evaluate and analyze achievements in relation to stated objectives, and that the existing annual maintenance plan is deficient. (Author)

AD-A027 358/1GA PC$10.00/MF$3.00
Air Force Cambridge Research Labs Hanscom AFB Mass
Air Force Cambridge Research Laboratories Report on Research, July 1972 - June 1974.
Interim rept. 1 Jul 72-30 Jun 74,
John F. Dempsey. May 75, 333p Rept nos. AFCRL-TR-75-0288, AFCRL-SR-192

Descriptors: *Air Force research, Laboratory tests, Laboratory procedures, Physics laboratories, Geophysics.

This is the seventh in a series of Reports on Research at the Air Force Cambridge Research Laboratories. This report covers a two-year interval. It was written primarily for Air Force and DOD managers of research and development and more particularly for officials in Headquarters Air Force Systems Command, for the Director of Science and Technology (DL), and for the Commanders of and the Laboratories within DL. The work of each of the laboratories is discussed as a separate chapter. Additionally, the report includes an introductory chapter on AFCRL management and logistic activities related to the reporting period.

AD-A027 589/1GA PC$5.00/MF$3.00
Ballistic Research Labs Aberdeen Proving Ground Md
On the Science of Information Retrieval.
Final rept.,
K. A. Pullen, and C. W. Hoffman. Jun 76, 93p Rept no. BRL-1896

Descriptors: Information retrieval, Subject indexing, Information systems, Data storage systems, Index terms, Abstracts, Thesauri, Clustering, Computer programming.

The science of recovery of technical information is examined in terms of size of the information bank, definitiveness, specificity, the mathematics of recovery from an information system, and decision theory. It is shown that the search decision is very sensitive to the quality of idea indexing. The factors leading to a profitable search decision are developed, and guidelines for maximizing indexing quality in this sense are formulated. Methods of use of the indexes generated to optimize availability of indexed information sources are considered, and alternatives for various sizes and kinds of libraries and information centers are reviewed. An experiment which may prove useful for measuring system effectiveness is described. The experiment can also give insight on how to improve rates of information transfer and how to increase capability of information assessment.

PB-253 962/5GA PC$4.00/MF$3.00
Federal Energy Administration, Washington, D.C. Office of Data and Analysis.
Energy Information Activities at the FEA,
Gil Rodgers. May 76, 49p FEA/B-76/218

Descriptors: *Energy, *Information services, Data processing, Coal, Crude oil, Petroleum, Imports, Exports, Electric power plants, Gas storage, Energy consumption, Fuel consumption, Energy policy, Solar energy, Natural gas, Gasoline, Jet engine fuels.

The Federal Energy Administration (FEA) is responsible for the development, publication, and dissemination of energy information. This information is prepared to support three primary missions. First, extensive, accurate data are needed to implement FEA programs, particularly regulatory operations. Second, reliable energy information is needed to develop and evaluate Federal energy policy. Third, FEA has a legislative mandate to publish statistical reports and analyses, data summaries, fact sheets, and other information to ensure that decisionmakers and the general public are kept fully informed. This publication explains those information activities.

PB-253 975/7GA PC$5.00/MF$3.00
National Science Foundation, Washington, D.C.
Federal Scientific and Technical Communication Activities: 1975 Progress Report.
Annual rept. Jan-Dec 75.
Jun 76, 99p* NSF-76-25

Descriptors: *Information centers, Information systems, Libraries, Management information systems, Telecommunications, National government, Services.

The report presents highlights of 1975 activities of over 60 Federal scientific and technical information programs in 15 executive departments and independent agencies, the Smithsonian Science Information Exchange, the Government Printing Office and the Library of Congress. Each program prepared its own description. The Division of Science Information, National Science Foundation, compiled the resulting descriptions and prepared a list of acronyms and abbreviations, and an index. A prefatory chapter summarizes significant developments and trends in Federal information programs. Further details are available in the program descriptions themselves or from the responsible agency officials whose names are appended.

PB-254 847/7GA PC$6.00/MF$3.00
Oregon Dept. of Human Resources, Salem.
System Requirements Report for the Client Information Retrieval System.
Jul 73, 136p SRS-12-55297-014
Grant SRS-12-55297

Descriptors: *Information systems, *Social services, Information retrieval, Data processing, Security, Project planning, User needs, Children, Unemployment, Public health, Social welfare, Rehabilitation, Vocational guidance, Handicapped persons, Oregon.

A 6-year plan was developed for modernizing data processing techniques, to allow the Department of Human Resources (DHR) to coordinate the function of its divisions toward the ultimate goal of providing integrated social services to clients. Due to limited computer technology, comprehensive client service information and program evaluation were not previously available. The report constitutes the 6-year plan.

PB-255 129/9GA PC$4.50/MF$3.00
Environmental Protection Agency, Washington, D.C.
Users' Guide to the Solid Waste Information Retrieval System Thesaurus,
John A. Connolly, V. Paul Fuschini, and Sandra S. Radinsky. 1974, 62p

Descriptors: *Solid waste disposal, *Information systems, Subject indexing, Indexes(Documentation), Information retrieval, Data processing, Dictionaries, Terminology, Refuse disposal, Thesauri, Subject index terms.

The purpose of this guide is to tell the user the depth to which information is indexed for entry into the Solid Waste Information Retrieval System (SWIRS) information bank, and to give him the tools for proper utilization of this bank. The guide is arranged in three sections. The first is a glossary that shows how certain terms are used in this particular information system. The second section is a formal thesaurus of the actual keywords by which abstracts are indexed for input to the SWIRS information bank. This is a simple alphabetical listing rather than hierarchical. In the third section are 'use' terms. This section lists terms that are not SWIRS keywords, and refers the user to the corresponding keywords that should be used either for indexing or for developing search strategies.

PB-255 485/5GA
Mag Tape $100.00;Foreign $122.50
Defense Logistics Services Center, Battle Creek, Mich.
NATO Supply Code for Manufacturers Excluding U.S. and Canada, Name Sequence. Data file,
Maxine Snader, and Jack Seelenbinder. Aug 76, mag tape DSA-FC-H4-3-Sec-B-Rev, DSA/DF-76/016
Supersedes PB-254 478.

Source tape is in EBCDIC character set. Tape can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Descriptors: *Data file, *Manufacturers, *Federal cataloging system, *Foreign countries, Identification, Organizations, Handbooks, Magnetic tapes, Supply management, Government procurement, Coding.
Identifiers: NATO supply codes, Names, Cataloging handbook H4-3B.

This file contains organizational entities (O.E.s) that maintain design control and/or is a source of supply for items procured and cataloged by agencies of the Federal Government, the North Atlantic Treaty Organization (NATO) member nations and other participating friendly governments, such as Australia. These coded organizational entities are in alphabetical sequence by name and record such information as the geographical location, former name and/or location, if applicable, assigned O.E. code, status of coded O.E.; i.e., active, obsolete, canceled with or without a replacement. In some instances, the replacement O.E. will be located in the United States, its possessions, or Canada. In this instance, refer to the Federal Supply Code for Manufacturers, United States and Canada (H 4-1/H 4-2) for the applicable replacement O.E. code data.

PB-255 488/3GA Mag Tape $100.00;Foreign $122.50
Defense Logistics Services Center, Battle Creek, Mich.
NATO Supply Code for Manufacturers, Excluding U.S. and Canada, Code Sequence.
Data file,
Maxine Snader, and Jack Seelenbinder. Aug 76, mag tape DSA-FC-H4-3-Sec-D-Rev, DSA/DF-76/017
Supersedes PB-254 479.
Source tape is in EBCDIC character set. Tape(s) can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Descriptors: *Data file, *Manufacturers, *Foreign countries, *Federal cataloging system, Coding, Handbooks, Supply management, Magnetic tapes, Government procurement, Organizations.
Identifiers: NATO supply codes, Cataloging handbook H4-3D.

This file contains organizational entities (O.E.s) that maintain design control and/or are a source of supply for items procured and cataloged by agencies of the Federal Government, the North Atlantic Treaty Organization (NATO) member nations and other participating friendly governments, such as Australia. These coded organizational entities are in O.E. code sequence and record such information as the name of the coded O.E., its geographical location, former name and/or location, if applicable, assigned O.E. code, status of coded O.E.; i.e., active, obsolete, canceled with or without a replacement. In some instances, the replacement O.E. will be located in the United States, its possessions, or Canada. In this instance, refer to the Federal Supply Code for Manufacturers, United States and Canada (H 4-1/H 4-2) for the applicable replacement O.E. code data.

PB-255 489/7GA PC$4.00/MF$3.00
Northwestern Univ., Evanston, Ill. Transportation Center.
The Effectiveness and Feasibility of a Network of Transportation Research Information Services (TRISNET) Regional Center in Information Transfer.
Final rept. Apr 74-Jun 75,
J. Rath Gustave, Ardwin Libman, Benjamin Jacobson, Jaime Silva, and Mary Roy. Oct 75, 39p DOT/TST-76/36
Contract DOT-OS-50090

Descriptors: *Information centers, *Transportation, Libraries, User needs, Project planning, Services, Information retrieval, Cost analysis, Illinois.
Identifiers: Chicago(Illinois), TRISNET(National Network of Transportation Research Information Services), National network of transportation research information services.

The National Network of Transportation Research Information Services (TRISNET) will include a series of regional centers to provide local access to the network and loans and photocopies of transportation documents cited in the TRIS abstracting/indexing services. This project investigated the role of the regional center through the offer of services to the transportation community (state and local government and private industry) in the Chicago metropolitan area. The study of user behavior patterns and acceptance of individual services establishes regional center functions: document delivery, TRIS-On-Line searches, referral to other TRISNET components and user feedback to TRISNET management. Regional centers should be located in areas of diversified transportation activity, capitalizing on existing general transportation information resources. Additional recommendations include regional center funding, charges, marketing and specialized products for TRISNET.

PB-255 503/5GA PC$9.75/MF$3.00
King Research, Inc., Rockville, Md. Center for Quantitative Sciences.
Statistical Indicators of Scientific and Technical Communication (1960-1980). Volume III: A Data Appendix to Volume II.
Final rept.,
D. W. King, D. D. McDonald, and N. K. Roderer. May 76, 315p* KRI-9212-III
Contract NSF-C878
See also PB-254 060.

Descriptors: *Periodicals, Statistical data, Characteristics, Technology transfer, Technical writing, Scientists, Engineers, Education, Publishing.
Identifiers: Scientific communication.

The report is Volume III of a four-volume report of research to develop a system of statistical indicators of scientific and technical communication. This volume is a data appendix to Volume II. It includes data from a longitudinal study of 191 journals published between 1962 and 1974. The data include characteristics of these journals, such as number of issues, number of articles, number of pages, number of characters per page, bibliographic citations, and so on. It is hoped that this report will be useful as a data reference tool to other researchers involved in the study of the scientific and technical journal literature.

PB-255 724/7GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Copyright Impacts of Future Technology.
Final rept.,
Madeline M. Henderson. 9 Feb 76, 4p
Pub. in Proceedings of Symposium of the American Chemical Society (Centennial Meeting), New York, NY, April 5, 1976. Jnl. of Chemical Information and Computer Sciences, v16 n2 p72-74 May 76.

Descriptors: *Information systems, *Microfilm, Technology innovation, Copyrights, Data storage, Photocopying, Requirements, User needs, Forecasting.
Identifiers: Computer output microfilm, Reprints.

Dynamic developments in computer and communication technologies, and in reprography and micrographies, are yielding systems and equipment that render better and faster access to information that has been copyrighted in traditional formats. Procedures and mechanisms must be worked out to permit us to take advantage of these technologies without destroying our basic systems of information dissemination.

PB-255 725/4GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
A Technological Review: The Future of Microimagery in the Library.
Final rept.,
Thomas C. Bagg. Oct 75, 11p
Pub. in Drexel Library Quarterly, v11 n4 p66-74 Oct 75. Also pub. as ISSN-0012-6160.

Descriptors: *Microfilms, *Libraries, Information retrieval, Data storage, Photomicrography, Requirements, Forecasting, User needs.
Identifiers: Computer output microfilm, Reprints.

Libraries are using microforms in a variety of ways and will add many more to their collections to save space, have available out-of-print materials, expand audiovisual materials and as the result of computer-generated microforms of frequently updated indexes, catalogs, listings, etc. Despite the growing need of micrographic equipment, the libraries do not offer a large enough market to have equipment designed and produced by their specific needs. Libraries must therefore depend upon developments for other applications, some of which are discussed.

PB-255 750/GA 16mm microfilm $42.00 or $62.00
U.S. Patent Classification - Subclass Listing. Edition No. 7. Patents Issued Through March 1976 and all Reclassifications Through Order no. 519. Patents Through 3,947,895. Reissue Patents Through 28,754. Design Patents Through 239,419. Plant Patents Through 3,855.
Apr 76,10 16mm microfilm reels or cartridgesPAT-002.1-7604-M
Individual reels available for $6.00; individual cartridges (specify type) available for $8.00.
Available in set of 10 16mm microfilm reels or cartridges (specify type): reel, PB-255 750-P, $42.00; 3M cartridge, PB-255 750-M, $62.00; Recordak cartridge, PB-255 750-R, $62.00; or Thread Easy magazine, PB-255 750-T, $62.00.

The publication is a listing of the U.S. patent numbers contained in each of the classes and subclasses of the U.S. Patent Classification System. This listing includes original and cross-reference classifications of patents. It includes all U.S. Patents from the very earliest to the latest available at time of publication. The classifications are also current as of the publication date. Individual reports are also available as follows:

Classes 2 Through 29, 1 reel, $6.00, or cartridge (specify) $8.00 PB-255 751/0GA
Classes 30 Through 68, 1 reel, $6.00, or cartridge (specify) $8.00 PB-255 752/8GA
Classes 69 Through 105, 1 reel, $6.00, or cartridge (specify) $8.00 PB-255 753/6GA
Classes 106 Through 148, 1 reel, $6.00, or cartridge (specify) $8.00 PB-255 754/4GA
Classes 149 Through 198, 1 reel, $6.00, or cartridge (specify) $8.00 PB-255 755/1GA
Classes 199 Through 235, 1 reel, $6.00, or cartridge (specify) $8.00 PB-255 756/9GA

Classes 236 Through 260, 1 reel, $6.00, or cartridge (specify) $8.00 PB-255 757/7GA
Classes 260 Through 296, 1 reel, $6.00, or cartridge (specify) $8.00 PB-255 758/5GA
Classes 297 Through 339, 1 reel, $6.00, or cartridge (specify) $8.00 PB-255 759/3GA
Classes 340 Through 528, 1 reel, $6.00, or cartridge (specify) $8.00 PB-255 760/1GA

PB-255 770/0GA
16mm microfilm $14.00 or $20.00
Patent Office, Washington, D.C.
Reclassification Transfer Records.
Aug 76, 3 16mm microfilm reels PAT-032.1-7608-M
Specify reel or cartridge type: 16mm microfilm reel, PB-255 770-P, $14.00; 3M cartridge, PB-255 770-M, $20.00; Recordak cartridge, PB-255 770-R, $20.00; or Thread Easy Magazine, PB-255 770-T, $20.00.

Descriptors: *Patents, *Patent classification, Microfilm.

This microfilm comprises a listing of original reclassification transactions for reclassification orders 520 and 524-540. The transactions are shown in three sequences: (1) New classification sequence; (2) patent number sequence; (3) old classification sequence.

PB-255 872/4GA PC$3.50/MF$3.00
National Inst. of Law Enforcement and Criminal Justice, Washington, D.C.
Terms and Definitions for Intrusion Alarm Systems,
G. N. Stenbakken, W. E. Phillips, and S. E. Bergsman. Oct 74, 21p LEAA-LESP-RPT-0305.00

Descriptors: *Burglar alarm systems, *Dictionaries, Warning systems, Terminology, Electronic security, Definitions, Law enforcement.

The report is an alphabetical compilation of over 300 definitions for commonly used terms. Included are all kinds of detectors, sensors, alarms, alarm systems, and electrical components.

PB-255 879/9GA PC$13.75/MF$3.00
National Bureau of Standards, Washington, D.C.
Publications of the National Bureau of Standards, 1975 Catalog. A Compilation of Abstracts and Key Work and Author Indexes.
Special pub.,
Betty L. Hurdle. Jun 76, 599p* NBS-SP-305-Suppl-7
See also Rept. no. NBS-SP-305-Suppl-6 dated Jun 75, COM-75-10926. Library of Congress Catalog Card No. 48-47112.

Descriptors: *Research, *Bibliographies, Abstracts, Catalogs(Publications), Periodicals, Indexes(Documentation), Authors, National government, Words(Language), Subject index terms.
Identifiers: National Bureau of Standards, Author indexes, Key words.

This supplement to Special Publication 305 Supplements 1 through 6 of the National Bureau of Standards lists the publications of the Bureau issued between January 1, 1975 and December 31, 1975. It includes an abstract of each publication (plus some earlier papers omitted from Special Publication 305 Supplement 6), key-word and author indexes; and general information and instructions about NBS publications.

5C. Economics

AD-A027 229/4GA PC$4.00/MF$3.00
Harvard Univ Cambridge Mass
On the Structure of the Set of Fixed Price Equilibria.
Technical rept.,
Guy Laroque, and Heraklis Polemarchakis. May 76, 32p Rept no. TR-23
Contract N00014-67-A-0298-0019
Report on Project on Efficiency of Decision Making in Economic Systems.

Descriptors: Economics, Decision making, Differential topology, Allocations, *Economic models, Set theory.
Identifiers: *Fixed price equilibrium, Rationing schemes, Utility functions, Micoreconomics, Quanity rationing, Prices.

Working in the framework suggested by Dreze, this paper studies the number of fixed price equilibria and their continuity with respect to the price system. In an exchange economy, the concept of a rationing scheme is introduced, which specifies how shortages are shared among agents. For given utility functions and a given rationing scheme, under stadard assumptions, and existence theorem is recalled, and it is shown that the graph of the equilibrium correspondence, when prices and initial endowments vary, is a piecewise continuously differentiable manifold. Moreover, generically, the number of equilibria for an economy, at given prices, is finite and the set of equilibria varies continuously with the price system and the initial endowments. (Author)

AD-A027 648/5GA PC$10.75/MF$3.00
American Univ Washington D C Foreign Area Studies
Area Handbook for North Korea,
Nena Vreeland, Rinn-Sup Shinn, Peter Just, and Philip W. Moeller. 1976, 393p DA-PAM-550-81
Supersedes report dated Oct 69, AD-698 982.

Descriptors: *North Korea, *Handbooks, Economics, Political science, Sociology, Public health, Transportation, Communication and radio systems, National defense, Military organizations.

The volume is one of a series of handbooks prepared by Foreign Area Studies (FAS) of The American University, designed to be useful to military and other personnel who need a convenient compilation of basic facts about the social, economic, political, and military institutions and practices of various countries. The emphasis is on objective description of the nation's present society and the kinds of possible or probable changes that might be expected in the future.

DIB-76-07-503 PC$10.00/MF$3.00
Target Research C.A., Caracas (Venezuela).
The Market for Building Products and Construction Equipment in Venezuela.
Foreign market survey rept.
Jan 76, 274p
Contract S54Fa-725-COMM
Sponsored in part by Domestic and International Business Administration, Washington, D.C.

Descriptors: *Market surveys, *Construction equipment, *Construction materials, *Venezuela, Exports, International trade, Market research, United States.
Identifiers: SIC 3211, SIC 3441, SIC 3558, SIC 3423, SIC 3531, SIC 3638, SIC 9770.

The market research was undertaken to study the present and potential US share of the market in Venezuela for building products and construction equipment; to examine growth trends in Venezuelan end-user industries over the next few years; to identify specific product categories that offer the most promising export potential for US companies; and to provide basic data which will assist US suppliers in determining current and potential sales and marketing opportunities. The trade promotional and marketing techniques were also reviewed.

DIB-76-07-504 PC$10.00/MF$3.00
American Embassy, Bogota (Colombia). Market Analysis Unit.
Post-Initiated Market Survey: Health Care Equipment and Systems.
Foreign market survey rept.
28 May 76, 112p
Sponsored in part by Domestic and International Business Administration, Washington, D.C.

Descriptors: *Market surveys, *Medical equipment, *Colombia, Exports, International trade, Market research, United States.
Identifiers: SIC 3841, SIC 3842, SIC 3861, SIC 3693, SIC 9770.

The market research was undertaken to study the present and potential US share of the market in Colombia for health care equipment and systems; to examine growth trends in Colombian end-user industries over the next few years; to identify specific product categories that offer the most promising export potential for US companies; and to provide basic data which will assist US suppliers in determining current and potential sales and marketing opportunities. The trade promotional and marketing techniques which are likely to succeed in Colombia were also reviewed.

DIB-76-07-505 PC$10.00/MF$3.00
American Embassy, Brussels (Belgium). Economic and Commercial Unit.
The Health Care and Medical Equipment Market in Belgium.
Foreign market survey rept.
26 Mar 76, 85p
Sponsored in part by Domestic and International Business Administration, Washington, D.C.

Descriptors: *Market surveys, *Medical equipment, *Belgium, X ray apparatus, Electric equipment, Exports, International trade, Market research, United States.
Identifiers: SIC 3842, SIC 3693, SIC 3811, SIC 3832, SIC 9770.

The market research was undertaken to study the present and potential US share of the market in Belgium for health care and biomedical equipment; to examine growth trends in Belgian end-user industries over the next few years; to identify specific product categories that offer the most promising export potential for US companies; and to provide basic data which will assist US suppliers in determining current and potential sales and marketing opportunities. The trade promotional and marketing techniques which are likely to succeed in Belgium were also reviewed.

DIB-76-07-506 PC$10.00/MF$3.00
P. A. Management Consultants (Pte) Ltd., Singapore.
Survey of the Singapore Market for Computers and Peripheral Equipment.
Foreign market survey rept.
Feb 76, 85p
Sponsored in part by Domestic and International Business Administration, Washington, D.C.

Descriptors: *Market surveys, *Computers, *Singapore, Exports, International trade, Market research, United States.
Identifiers: SIC 3573, SIC 9770.

The objective of the survey was to provide the following information: An overview of the computer and peripheral market in Singapore; identification of the specific types of computers and peripherals for which the market appears to hold particular promise over the next 5 years; identification of market sectors that offer the best opportunities for sales of equipment and peripheral equipment; identification of market conditions that facilitate or impede the import or sales of US equipment in Singapore; and an indication of types of US Department of Commerce sponsored overseas trade events.

DIB-76-07-507 PC$10.00/MF$3.00
Metra Industria, Milan (Italy). Div. of Marketing.
Survey of World Markets for Computers and Peripheral Equipment, Italy.
Foreign market survey rept.
May 76, 127p
Sponsored in part by American Consulate General, Milan (Italy), and Domestic and International Business Administration, Washington, D.C.

Descriptors: *Market surveys, *Computers, *Italy, Computer components, Computer storage devices, Exports, International trade, Market research, United States.
Identifiers: SIC 3573, SIC 9770.

The study assesses the market potential for computers and peripheral equipment in Italy and determines medium to long range prospects in Italy for the 5-year period 1976 to 1980 for US exports of computers and peripheral equipment. The scope of the study includes An assessment of the market potential for computers and peripheral equipment in Italy during the 5-year period 1976-1980; identification of specific products having promising market potential during the period 1976-1980; identification of market sectors that offer the best opportunities for sales of computers and peripheral equipment; assessment of the competitive position of US suppliers of computers and peripheral equipment, including a study of the market strategies of major third-country suppliers; identification of market conditions in Italy that affect the importation of US computers and peripheral equipment; and recommendation on future major trade events suitable for promotion of exportation of US computers and peripheral equipment to Italy.

DIB-76-07-508 PC$10.00/MF$3.00
Sup (Kim Paing) (Republic of Korea).
Market Research: Post Study Computers and Peripheral Equipment, Republic of Korea.
Foreign market survey rept.,
Kim Paing Sup. 25 May 76, 155p
Sponsored in part by Domestic and International Business Administration, Washington, D.C.

Descriptors: *Market surveys, *Computers, *South Korea, Data processing equipment, Data transmission, Exports, International trade, Market research, United States.
Identifiers: SIC 3573, SIC 9770.

The study assesses the market potential for computers and peripheral equipment in South Korea and determines medium to long range prospects in South Korea for the 5-year period 1976 to 1980 for US exports of computers and peripheral equipment.

DIB-76-07-509 PC$10.00/MF$3.00
IDC Europa Ltd., London (England).
Survey of World Markets for Computers and Peripheral Equipment, Belgium.
Foreign market survey rept.
Apr 76, 127p
Sponsored in part by Domestic and International Business Administration, Washington, D.C.

Descriptors: *Market surveys, *Computers, *Belgium, Exports, International trade, Market research, United States.
Identifiers: SIC 3576, SIC 9770.

The objective of the survey was to provide the following information: An overview of the computer and peripheral market in Belgium; identification of the specific types of computers and peripherals for which the market appears to hold particular promise over the next 5 years; identification of market sectors that offer the best opportunities for sales of equipment and peripheral equipment; identification of market conditions that facilitate or impede the import or sales of US equipment in Belgium; and an indication of types of US Department of Commerce sponsored overseas trade events.

DIB-76-07-510 PC$10.00/MF$3.00
Pacific Products, Ltd., Tokyo (Japan).
Japanese Market for Computer and Peripheral Equipment.
Foreign market survey rept.
Apr 76, 189p
Sponsored in part by Domestic and International Business Administration, Washington, D.C.

Descriptors: *Market surveys, *Computers, *Japan, Data processing equipment, Banking business, Data transmission, Computer components, Exports, International trade, Market research, United States.
Identifiers: SIC 3576, SIC 9770.

The scope of the study includes: an assessment of the market potential for computers and peripheral equipment in Japan during the 5-year period 1976-1980, identification of specific products having promising market potential during the period 1976-1980, and identification of market sectors that offer the best opportunities for sales of computers and peripheral equipment. The study also assesses the competitive position of US suppliers of computers and peripheral equipment, including a study of the market strategies of major third-country suppliers; identifies market conditions in Japan that affect the importation of US computers and peripheral equipment; and recommends future major trade events suitable for promotion of exportation of US computers and peripheral equipment to Japan.

DIB-76-07-511 PC$10.00/MF$3.00
Trancu (Theodore C.) and Associates, Milan (Italy).
Survey on the Italian Market for Electronic Components and Production Equipment.
Foreign market survey rept.
Apr 76, 126p
Contract S237Fa-192-COMM
Sponsored in part by American Consulate General, Milan (Italy), and Domestic and International Business Administration, Washington, D.C.

Descriptors: *Market surveys, *Electric equipment, *Italy, Exports, Internal trade, Market research, United States.
Identifiers: SIC 3643, SIC 3662, SIC 3599, SIC 3676, SIC 3675, SIC 3823, SIC 3672, SIC 3674, SIC 9770.

The market research was undertaken to study the present and potential US share of the market in Italy for electronic components and production equipment; to examine growth trends in Italian end-user industries over the next few years; to identify specific product categories that offer the most promising export potential for US companies; and to provide basic data which will assist US suppliers in determining current and potential sales and marketing opportunities. The trade promotional and marketing techniques which are likely to succeed in Italy were also reviewed.

NTIS/PS-76/0621/3GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Wages Salaries, and Earnings. Volume 2. 1974-Jul, 1976 (A Bibliography with Abstracts).
Rept. for 1974-Jul 76,
Mary E. Young. Aug 76, 104p*
Supersedes NTIS/PS-75/567.

Descriptors: *Bibliographies, *Salaries, *Manpower, Earnings, Employment, Skilled workers, Unskilled workers, Professional personnel, Background, Minority groups, Females, Mobility, Education, Upgrading, Discrimination, Productivity, Personnel development.
Identifiers: Labor force.

Studies of employee compensation in the United States are cited. Included are reports on the effects of education, age, and health on earnings, the impact of labor unions, fringe benefits, problems of the disadvantaged and minorities, and statistics for specific industries. (This' updated bibliography contains 99 abstracts, 35 of which are new entries to the previous edition.) See also NTIS/PS-75/568, Wages, Salaries, and Earnings. Vol. 1. 1964-1973.

PB-248 151-17/GA MF$3.00
Department of Commerce, Washington, D.C.
Commerce America. Volume I, No. 17.
16 Aug 76, 40p
Available in microfiche only.

Descriptors: *Commerce, *Periodicals, Technology, Engineering, Standards, Waste treatment, Apartment buildings, Housing studies, Energy conservation, Research.
Identifiers: Waste recycling, Condominiums.

Contents:
- Scientists and engineers in the private sector increase their understanding of government and vice versa through the Research Associate Program at Commerce's National Bureau of Standards;
- The second time around--federal government emphasizes recycling;
- Economic highlights;
- Energy digest;
- Domestic business report;
- International commerce report.

PB-251 740/GA
see prices of individual reports
International Customs Tariffs Bureau, Brussels (Belgium).
International Customs Journal. Year 1975-1976.
Bulletins.
1975-76approx.50 issues annuallynternational Customs Journal. Year 1975-1

The reports present authoritative information for exporters, importers, inventors, manufacturers, and those concerned with international trade. They contain the schedules of duties and exemptions applicable to goods imported into or exported from the country. Order by individual numbers listed below:
Bull-20. Greece. 9th ed, Mar 76, 384p.
PC$10.75/MF$3.00, supersedes COM-71-00721 PB-251 740-020/GA

PB-255 081/2GA PC-GPO
Bureau of the Census, Washington, D.C.
Current Business Reports. Monthly Wholesale Trade. Sales and Inventories.
Monthly rept. Dec 75.
Feb 76, 27p BW-75-12
See also COM-73-70069.
Paper copy available from GPO.

Descriptors: *Commerce, Statistical data, Sales, Inventories, Businesses.

Identifiers: *Current Business Reports, *Wholesale trade, Durable goods, Nondurable goods.

For the current month and 12 preceding months, data are presented for the United States on estimated monthly sales of merchant wholesalers, by kind of business, estimated monthly sales, by geographic divisions, for merchant wholesalers in total, for durable goods, and for nondurable goods wholesalers; monthly inventories of merchant wholesalers, for selected kinds of business and estimated monthly sales, inventories, and stock-sales ratios of merchant wholesalers, for selected kinds of business. The December report also includes 12 months' sales inventories and stock-sales ratios, by kind of business. It also shows annual sales, year-end inventories, and stock-sales ratios from 1964 to 1974.

PB-255 082/0GA PC-GPO
Bureau of the Census, Washington, D.C.
Current Business Reports. Monthly Retail Trade. Sales and Accounts Receivable.
Monthly rept. Jan 76.
Mar 76, 39p BR-76-01
See also COM-74-70095.
Paper copy available from GPO.

Descriptors: *Commerce, Statistical data, Sales, Accounting, Businesses, Regions, Metropolitan areas.
Identifiers: *Current Business Reports, *Retail trade, Durable goods, Nondurable goods, Department store sales.

Data are given for the United States, current month, with comparisons for previous months on estimates of monthly retail sales by major kind-of-business groups and selected individual kinds of business; separate figures are shown, in more limited kind-of-business detail, for firms operating 11 or more retail stores. Summary sales data are presented for geographic regions and divisions, selected states, large standard metropolitan statistical areas, and cities. Also included are national estimates of end-of-month accounts receivable balances outstanding for all retail stores and, separately, for firms operating 11 or more retail stores. Separate data are shown for charge accounts and installment accounts. National sales and accounts receivable estimates are shown adjusted for seasonal variations and trading day differences, as well as in unadjusted form. This report also includes data on department store sales published separately in Monthly Department Store Sales for Selected Areas.

PB-255 171/1GA PC$9.75/MF$3.00
Ernst and Ernst, Washington, D.C.
Energy-Economy Relationships.
Final rept. on Topic 2.
Jun 76, 313p*
Contract DI-14-03-6101N
Report of the Role of BPA in the Pacific Northwest Power Supply System, Including Its Participation in the Hydrothermal Power Program. See also PB-255 170.

Descriptors: *Energy consumption, *Fuel consumption, *Economic analysis, *Aluminum industry, Food industry, Textile industry, Paper industry, Chemical industry, Rubber industry, Glass industry, Metal industry, Industries, Employment, Manpower, Production, Gross National Product, Electricity, Rates(Costs), Energy conservation, Trends.
Identifiers: Electric power consumption, Residential sector, Commercial sector, Transportation sector, Agricultural sector, Industrial sector, SIC 20, SIC 21, SIC 22, SIC 23, SIC 24, SIC 25, SIC 26, SIC 27, SIC 28, SIC 29, SIC 30, SIC 31, SIC 32, SIC 33, SIC 34, SIC 35, SIC 36, SIC 37, SIC 38.

In order to address the relationships between energy (and electricity) use and economic development, this study examined both aggregated national data and detailed industry data. The objectives were to provide a theoretical and quantitative description of the relationships between energy, electricity, employment, and output for specified industry groups, focusing on electricity use in the aluminum industry because of its importance as a Pacific Northwest electricity consumer.

PB-255 173/7GA PC$11.00/MF$3.00
Bureau of Economic Analysis, Washington, D.C.
Business Statistics, Biennial Edition (20th), 1975.
May 76, 406p* BEA-SUP-76-08
The Biennial supplement to the Survey of Current Business. See also report dated Sep 73, COM-74-50032.

Descriptors: *Commerce, *Economic analysis, *Periodicals, Statistical data, Gross National Product, Income, Balance of payments, Prices, Construction, Sales, Employment, Finance, International trade, Transportation, Industries.
Identifiers: *Survey of Current Business, *Business economics.

The document provides historical data for the 2,500 series appearing in the Survey of Current Business. In addition to data on the national income and product accounts (which reflect the 1976 benchmark revisions), the volume covers plant and equipment expenditures, balance of payments, business sales, inventories and orders, prices, employment and unemployment, construction, banking and finance, foreign trade, transportation, commodities, and industries. It includes a section of explanatory notes which define terms, give sources of data, and describe methods of compilation.

PB-255 348/5GA PC$9.25/MF$3.00
Massachusetts Inst. of Tech., Cambridge.
Generating Inequality: The Distributional Mechanisms of the Economy.
Final rept.,
Lester C. Thurow. Jan 75, 299p DLMA-21-25-73-36
Grant DL-21-25-73-36

Descriptors: *Economic models, *Salaries, Income, Economic analysis, Productivity, Education, Abilities, Government policies, Personnel selection, Discrimination, Females, Minority groups, Employment.
Identifiers: On job training.

The author adopts a job competition as opposed to the neoclassical wage competition model of the labor market. In this model, jobseekers' background characteristics are used by employers to select workers and to predict potential success on the job and extent of training needed. On-the-job training is the primary source of cognitive skill and therefore the primary determinant of productivity. The findings offer an alternative theory of race and sex discrimination and raise serious questions as to the value of manpower training and other forms of human capital investment.

PB-255 437/6GA PC$16.25/MF$3.00
Colorado Univ., Boulder.
Adjustment of High Technology Organizations to Reduced Military Spending: The Western European Experience: Main Report,
Bernard Udis. Oct 74, 631p NSF/RA/X-75-016
Grant NSF-GI-34923

Descriptors: *Technology transfer, *Military planning, *Western Europe, *Industries, *Economic analysis, Conversion, Employment, Military facilities, Laboratories, Market research, National government, Belgium, France, Italy, Sweden, Great Britain, Balance of payments, West Germany, Netherlands, Questionnaires.

The report is based on a study conducted in seven major industrial countries in Western Europe. Its principal objective was to gain insight into the problem of adjustment of military expenditures to civilian markets in high technology nations. A conversion from military to civilian markets causes certain policy problems such as: (1) The necessity to maintain high level employment; (2) the necessity to keep pace technologically; (3) the economic necessity to utilize existing laboratories and other facilities originally developed for military purposes; (4) the continuous balance of payments problem; and (5) maintaining a minimum base in high technology capability in order to be an intelligent purchaser. The report is based mainly upon a series of interviews with industrial executives, government officials, university professors, and journalists. The seven European countries studied were Belgium, United Kingdom, France, Germany, Holland, Italy, and Sweden. Included in the appendices are a list of interviews conducted in each country by type and a sample questionnaire which was submitted to industrial firms.

PB-255 538/1GA PC$5.50/MF$3.00
Booker (R. W.) and Associates, Inc., St. Louis, Mo.
Market and Feasibility Study of the Kansas City - Wyandotte County, Kansas Port Facility and Industrial Park, Kansas City, Kansas.
Final rept.
Oct 74, 109p RWB-01128, EDA-76-012
Contract C-3-36763

Descriptors: *Technical assistance, *Site surveys, *Industries, *Economic development, *Kansas, Economic analysis, Socioeconomic status, Market research, Feasibility, Project planning, Harbors, Missouri River, Metropolitan areas, Layout, Transportation, Government, Cost estimates.
Identifiers: Industrial parks, Wolcott Site, Wyandotte County(Kansas), Kansas City(Kansas), Industrial development.

The objective of the study was to determine the market feasibility of the Wolcott Site for development as an industrial park and port facility on the Missouri River. The scope of the study involved; an analysis of the socioeconomic aspects, physical suitability, and inventory and evaluation of industrial development of the entire Kansas City Metropolitan Region. The study also includes a conceptual industrial and port facility layout with cost estimates, and recommendations for organization and administration.

PB-255 617/3GA PC$5.00/MF$3.00
West Piedmont Planning District Commission, Martinsville, Va.
An Economic Analysis for Development of the Counties, Cities and Towns of the West Piedmont Planning District.
Technical assistance rept.,
Sandra S. Batie, David Berry, J. T. Buck, Joseph D. Coffey, and Donald Groover. 1975, 78p
Grant EDA-01-6-09689-70
Prepared in cooperation with Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Agricultural Economics.

Descriptors: *Economic development, *Technical assistance, *Virginia, Economic analysis, Socioeconomic status, Profiles, Industries, Businesses, Local government, Agriculture, Forestry, Recreation, Employment, Regional planning.
Identifiers: West Piedmont planning district, Tourism, Industrial growth.

The study reports the findings of a comprehensive analysis of the major segments of the economy of the West Piedmont Planning District, Virginia. The analysis was utilized to determine the development and adjustment opportunities in the area. The study provides benchmarks and relationships for analyzing changes over time. Procedures are given for estimating the impacts of major changes. Measures and procedures are given for estimating the impacts on the area of any announced or projected new developments.

PB-255 649/6GA PC$5.00/MF$3.00
International Planning Management Corp., Bethesda, Md.
Small Business in the Metals Industry: A Background Study.
Final rept.
24 May 76, 88p NSF/RA-76017
NSF-Order-76-SP-0871

Descriptors: *Mental industry, *Businesses, *Economic surveys, Extractive metallurgy, Technology innovation, Management planning, Marketing, Reviews, Data acquisition, District of Columbia, Government policies, Commodity management, Metalliferous ores, Mining, Beneficiation, Raw materials, Foundries, Materials recovery, Solid waste disposal.
Identifiers: Waste recycling, High technology industries, Service companies, Secondary materials industry, Small businesses.

The objective of this study is to identify the principal small business roles in, and innovations of particular importance to, the metallurgical industry, together with associated planning and policy issues, marketing issues, and institutional arrangements. The scope of this study is confined primarily to the extraction and processing phases of the metals cycle. Extraction includes all stages prior to metal processing: mining, beneficiation of ores, reduction, smelting, and refining of the pure metals. Processing includes alloying, heat treating, rolling, casting, and fabrication. The role of small business in metals recycling and substitution is also considered but with less emphasis. The approach of the study combines literature review and letters of inquiry with personal interviews in the Washington, D.C. area. Three broad areas were identified in which small business is actively involved: high technology, service companies, and secondary recovery. A list of the individuals and institutions contacted is included in Appendix A, and a selected bibliography in Appendix B.

PB-255 866/2GA PC$4.00/MF$3.00
Rhode Island State Dept. of Economic Development, Providence.
Naval Installations Re-Use Project Completion Report.
Technical assistance rept.
Mar 76, 41p EDA-76-015
Grant EDA-01-8-09711-26

Descriptors: *Economic assistance, *Rhode Island, Surveys, Regional planning, Leadership, Projects, Management planning, Objectives, Recovery, Grants, National government, Businesses, Utilization, Military facilities, Specialized training, Conversion, Problem solving.
Identifiers: Economic distress areas, Military facility cutbacks, Naval facilities reuse.

This report describes how the state of Rhode Island utilized technical assistance funds provided by EDA in support of efforts to recover from the economic dislocation caused by the Navy's realignment decisions in 1973.

PB-255 873/2GA PC$3.50/MF$3.00
Wyoming Valley Retail Grocers Association, Wilkes-Barre, Pa.
Flood Recovery Program for Members of the Wyoming Valley Retail Grocers Association, Pennsylvania.
Jun 74, 17p EDA-76-018
Grant EDA-01-8-01005-70

Descriptors: *Floods, *Regional planning, *Economic assistance, Pennsylvania, Tropical cyclones, Recovery, Technical assistance, Organizations, Forecasting.
Identifiers: Tropical storm Agnes, Wyoming Valley Retail Grocers Association, *Wilkes Barre(Pennsylvania).

This study in short summarizes the program of the Wyoming Valley Retail Grocers Association(Pennsylvania) recovery of the devastating damage caused by Tropical Storm Agnes.

PB-255 874/0GA PC$4.50/MF$3.00
Booker (R. W.) and Associates, Inc., St. Louis, Mo.
Comprehensive Report. Walnut Ridge Airport Industrial Park Feasibility Study.
Final rept.,
Robert C. Flory. Apr 74, 75p EDA-76-019
Contract C-3-36766

Descriptors: *Urban areas, *Industrial readiness, *Economic surveys, Arkansas, Airports, Economic development, Community development, Regional planning, Technical assistance, Inventories, Resources, Objectives, Employment, Feasibility.
Identifiers: *Walnut Ridge(Arkansas), Industrial parks.

This report is based on findings that the city of Walnut Ridge would like to attract more industry. In order to decrease the high rate of unemployment and increase job opportunities, an inventory of the social, economic, and physical resources of the area was undertaken. Objectives for expanding industrial development are to be established.

PB-256 089/4GA PC$4.00/MF$3.00
National Marine Fisheries Service, Washington, D.C. Div. of Economic and Marketing Research.
Food Fish, Market Review and Outlook.
Current economic analysis F-23,
Morton M. Miller. Mar 76, 49p NOAA-FFSOA-23, NOAA-76042602

Descriptors: *Market surveys, *Food, *Fishes, *Seafood, Cod, Flatfishes, Tunas, Salmon, Perch, Fresh water fishes, Market research, Fisheries, Food processing, Canning, Consumption, Statistical data.

The economic and marketable outlooks for the fishing industry are discussed. The report reviews statistics of the most commonly consumed fishes and gives an indication of the market outlook for each fish type based on this data.

5D. History, Law, and Political Science

AD-A027 223/7GA PC$4.50/MF$3.00
Stanford Research Inst Arlington Va Strategic Studies Center
The Soviet Concept of the 'Correlation of Forces'.
Final technical rept.,
Michael J. Deane. May 76, 59p Rept no. SSC-TN-4383-1
Contract MDA903-75-C-0347, ARPA Order-2520

Descriptors: *Foreign policy, *USSR, United States Government, Political science, Government(Foreign), Leadership, Attitudes(Psychology), International relations, Geopolitics, Communism, Assessment, Military assistance, History.
Identifiers: Correlation of forces policy(USSR).

This report analyzes the Soviet concept of the correlation of forces. It attempts from review of historical and contemporary Soviet literature (1) to illuminate the various factors subsumed under the concept, (2) to indicate the extent to which the concept represents a systematic approach to foreign policy, and (3) to assess the Soviet leadership's current evaluation of the international balance between the United States and the USSR. (Author)

AD-A027 245/0GA PC$6.75/MF$3.00
Naval Postgraduate School Monterey Calif
Measuring Aircraft Capability for Military and Political Analysis.
Master's thesis,
Allan Wesley LeGrow. Mar 76, 161p

Descriptors: *Military assistance, *Military aircraft, Jet fighters, Military forces(United States), Hazards, Government(Foreign), Scaling factors, Factor analysis, Policies, Assessment, Decision theory, Aerial warfare, Comparison, Military procurement, Theses.
Identifiers: *Arms transfer.

This thesis explores the question of measuring weapons capability for application in arms transfer studies and military analysis. A review of common theories and methods of scaling and a discussion of measurement techniques currently used in arms transfer research, provide background information for the sections on capability measurement. Two conceptual approaches to capability are developed and the problems of measuring capability discussed. A discussion of possible ways to measure capability follows and four scaling techniques presented; factor analysis; paired comparisons; successive intervals; and multi-attribute utility scaling. After clarifying their theoretical bases, strengths, and weaknesses, each method is used to scale aerial combat capability in fighter aircraft. One major conclusion reached is that judgemental scaling techniques are presently more valuable for measuring capability than more computerized procedures such as factor analysis. A second conclusion is that multi-attribute utility scaling affords the best opportunity for ratio comparisons of weapon capability.

AD-A027 633/7GA PC$5.50/MF$3.00
Army Command and General Staff Coll Fort Leavenworth Kans
The Federal Government and the Creek Indians, 1775-1813.
Final rept.,
Frank H. Akers, Jr. 11 Jun 76, 124p
Master's thesis.

Descriptors: *Ethnic groups, *Political science, *United States Government, Policies, Attitudes(Psychology), History, Leadership, Treaties, Theses.
Identifiers: *American Indians, *Creek Indians.

One of the immediate problems facing the United States in 1775 was that of relations with the Indian tribes of North America. Study of the transactions between the federal government and the Creek Indians from 1775 to 1813 offers many insights into the development of a national Indian policy. The period encompassed by the study includes U.S.-Creek interaction from its birth until the outbreak of general hostilities between the two nations. Creek-American affairs during this time were characterized by continued white encroachment upon Indian lands, haphazard negotiations, and an identity crisis on the part of the Creeks as they became more dependent upon the white man. Meanwhile the United States, burdened with the task of establishing a stable government, struggled to develop a coherent and consistent policy for dealing with the Indians within its borders. Frequently, Indian matters received less attention than more visible issues. The conclusions reached in this study indicate that

the United States lacked the means and the will to allocate resources in proportion to the magnitude of the Indian problem it faced. The policies followed by the government, however, were consistent with the desires of the majority of its citizens and played a major role in reducing conflict on the frontier.

PB-255 650/4GA PC$9.00/MF$3.00
Resource Center for Consumers of Legal Services, Washington, D.C.
The Role of Research in the Delivery of Legal Services: Working Papers and Conference Proceedings,
L. Brickman, and R. Lempert. May 76, 267p*
NSF/RA-760089
Grant NSF-APR76-04274

Descriptors: *Law(Jurisprudence), *Services, *Research projects, *Meetings, Litigation, Delivery, Low income groups, Professional personnel, Expenses.
Identifiers: *Legal services.

The report includes working papers and conference proceedings that address the problem of unmet legal needs among the low and middle income population. There is recognition of the defects in approach, coordination, and coverage of research which impedes the delivery of legal services. The purposes of this project are: (1) to ascertain which research and demonstration projects have been undertaken; (2) to assemble the data thus far generated into its most readily assimilatable form; (3) to identify those areas which have not been adequately researched; (4) to establish priorities for further research; and (5) to explore how coordination of the research and data gathering activities of various agencies and instrumentalities delivering or otherwise involved with delivering legal services, could be undertaken. A number of research hypotheses, concerning the provision of high-quality, low-cost legal services, are postulated. Research papers are prepared to identify data sources and research projects to confirm or reject these hypotheses. The papers commissioned are to constitute an information base for a planned conference by describing the research done and suggesting ideas for future research.

5E. Human Factors Engineering

AD-A027 177/5GA PC$5.00/MF$3.00
Rockwell International Anaheim Calif Electronics Research Div
Variable-Transmittance Visor for Helmet-Mounted Display.
Final rept. Jul 71-Jun 73,
John P. Dobbins. Jul 76, 80p C71-838/501, AMRL-TR-74-28
Contract F33615-71-C-1938

Descriptors: *Helmet mounted displays, *Visors, *Flight helmets, Light transmission, Optical properties, Electrooptics, Human factors engineering, Acrylic resins, Polycarbonates, Cellulose, Polystyrene, Fluorinated hydrocarbons.
Identifiers: *Optronic properties, Polyvinylcarzoles, Ally diglycol carbonates.

Efficient operation of HMD's (helmet-mounted displays) requires the use of VTV's (Variable-transmittance visors) to maintain constant visual contrast between projected images and their backgrounds. No VTV's responding controllably or reversibly with rapidity had been developed prior to this program. A high-priority military objective was to encourage the design and development of such VTV's. An unsolicited proposal to the USAF, based on a new concept, suggested the use of a liquid optronic medium in a sandwich-cell visor configuration with automatic control of variable transmittance. Three such units were installed in flight helmets and delivered to the customer as airborne feasibility demonstrators. These accommodated variations in external brightness over a range greater than 80:1. Automatic regulation was provided from light sensors, behind the visors, connected to closed-loop, electronic controllers using 28-vdc aircraft power. Controllers were packaged as pocket-size units with self-contained batteries for emergency operation. Most effort was directed toward solving critical problems involved in the selection, processing, and fabrication of materials suitable for this application. Among the many mathematical relationships, both optical and optronic, put to practical use in the VTV design were several derived.

AD-A027 428/9GA PC$5.00/MF$3.00
Caci Inc-Federal Arlington Va
Human Factors Problems of the Command, Control, and Communication Process in the 1990's.
Interim technical rept. 2 Mar-13 Jul 76,
Richard Hayes, J. Brownell, J. Hayes, and B. Spector. 14 Jul 76, 87p
Contract MDA903-76-C-0219, ARPA Order-3201

Descriptors: *Human factors engineering, *Social communication, Planning, Social sciences, Political science, Environments, Attitudes(Psychology), Economics, Decision theory, Forecasting.
Identifiers: *Future environments, Expert opinion exploration, Alternatives for future environment development, Forecasting 1990 environments.

This report describes research completed on the first four tasks of the study. Two quite different descriptive structures are built that will interact in subsequent tasks to provide the study outcome. First, a set of human factors activities involved in the C(3) process is enumerated and the determining forces controlling these human factors are elaborated. Second, a list of variables constituting the set of relevant dimensions of future (1990) environments for C(3) centers is developed, and, by analyzing the literature and exploring expert opinion, values for these variables are specified which in aggregate constitute meaningful alternative futures. (Author)

AD-A027 516/4GA PC$3.50/MF$3.00
Webb Associates Inc Yellow Springs Ohio
Anthropometric Sizing Program for Oral-Nasal Oxygen Masks Based on 1967 U.S. Air Force Survey Data,
John T. McConville, and Milton Alexander.
1975, 9p AMRL-TR-75-51
Contract F33615-75-C-5003
Availability: Pub. in Aviation, Space, and Environmental Medicine, v46 n11 p1383-1389 Nov 75.

Descriptors: *Anthropometry, *Oxygen masks, Flight crews, Faceplates, Models, Human factors engineering, Experimental design, Fittings, Sizes(Dimensions), Reprints.

A new sizing program for oral-nasal masks, based on total facial length, has been developed through an analysis of the 1967 USAF anthropometric survey head and face data. A four-size series of three-dimensional face forms has been sculpted based on this sizing program as a design aid for sizing such masks. This report includes a discussion of the theoretical and practical aspects of the sizing analyses and procedures, and establishes design limits and procurement tariffs for the four sizes of masks. The MBU-12/P oxygen mask, an oral-nasal, pressure-demand type of mask, has been fabricated in accordance with this sizing system using the face forms as sizing guides. The results obtained during fit-tests using 66 USAF personnel as subjects are described. The authors concluded that the dimensional sizing of the oral-nasal oxygen mask facepieces is valid for USAF flight crews. (Author)

5G. Linguistics

AD-A027 652/7GA PC$4.00/MF$3.00
Purdue Univ Lafayette Ind School of Electrical Engineering
Speaker Recognition from an Unknown Utterance and Speaker-Speech Interaction,
R. L. Kashyap. Jan 76, 30p TR-EE76-4, AFOSR-TR-76-0692
Grants AF-AFOSR-2661-74, NSF-ENG74-17586

Descriptors: *Speech recognition, *Phonemes, Computational linguistics, Decision theory, Word recognition, Statistical analysis.

The authors are interested in determining whether a given utterance comes from a member of a given speaker group or an imposter. If it is the former, they are interested in determining the identity of the speaker. The only knowledge available is a set of known utterances from the given group of speakers. The given utterance is manually divided into phonemes without necessarily ascertaining the identity of phonemes. Using statistical decision theory they develop various types of tests for speaker verification and identification using only one phoneme segment or the entire utterance. They consider related problems such as the methods of clustering speakers to aid speaker verification, the optimal choice of phonemes for speaker recognition.

5H. Man-Machine Relations

AD-A027 613/9GA PC$3.50/MF$3.00
Systems Control Inc Palo Alto Calif
Identification of a Modified Optimal Control Model for the Human Operator,
Anil Phatak, Howard Weinert, Ilana Segall, and Carroll N. Day. 24 Jul 74, 12p AMRL-TR-75-27
Contract F33615-73-C-4021
Availability: Pub. in Automatica, v12 p31-41 1976.

Descriptors: *Man machine systems, *Operators(Personnel), Mathematical models, Optimization, Performance(Human), Computerized simulation, Manual operation, Control theory, Tracking, Reprints.
Identifiers: Optimal control.

The optimal control model for the human operator has emerged as one of the most promising models for the study of human performance in complex tasks. Previous applications of this model have used heuristic methods based on empirical data to establish numerical values for the model parameters. In this paper, the standard optimal control model is analyzed from the viewpoint of system identification. It is shown that the existing model structure is over-parameterized and can be simplified by modifying some of the original assumptions. Identifiability of the resulting modified optimal control model is investigated. As a result, a systematic procedure for the identification of the modified optimal control model parameters from available data is developed. This procedure is validated by application to experimental data from simulation of a piloted tracking task. The paper concludes with recommendations for further simplification in the human operator model structure. (Author)

5I. Personnel Selection, Training, and Evaluation

AD-A027 232/8GA PC$4.50/MF$3.00
Naval Postgraduate School Monterey Calif
Developing a Measure of Marine Corps Recruiting Effectiveness.
Master's thesis,

Robert J. Sullivan. Jun 76, 54p

Descriptors: *Marine Corps personnel, *Recruiting, Productivity, Forecasting, Predictions, Effectiveness, Minorities, California, Education, Sampling, Statistical analysis, Theses.
Identifiers: Measures of effectiveness.

This study analyzed the Fiscal Year 1975 Marine Corps enlistment productivity and recruiting effort in the State of California. Twelve variables describing the public high schools in California were used to predict enlistment productivity and recruiting effort. It was determined that productivity could be predicted on the basis of recruiting effort alone. This meant that the recruiting substations in this study, on the average, achieved their productivity goals. Recruiting effort was found to be applied on the basis of male minority students enrolled in vocational education programs and in school districts that had a high percentage of their income from local sources. A measure of recruiting effectiveness was proposed. The model developed in the study gave a predicted productivity figure for a cross-validation sample of thirteen recruiting substations. The actual productivity of each substation was compared to the predicted value. This ratio was used as the measure of effectiveness. (Author)

AD-A027 238/5GA PC$5.00/MF$3.00
Naval Postgraduate School Monterey Calif
Computer-Assisted Detailing for U.S. Naval Officers.
Master's thesis,
William Brooks Blaisdell Moody. Jun 76, 93p

Descriptors: *Computer applications, *Naval personnel, *Officer personnel, *Personnel management, Billets(Personnel), Computer applications, Distribution, Manpower utilization, Computer programs, Theses.
Identifiers: Future MAPMIS project.

The author, a former Naval officer detailer, explains and discusses officer assignment and distribution practices in the Bureau of Naval Personnel including computer support to the current manual officer assignment/distribution system. He reviews recent literature relating to computer-assisted assignment of personnel within the interpretive framework of approaches used. He next discusses the computer-assisted detailing system proposed for implementation in the Officer Development and Distribution Division of the Bureau of Naval Personnel under the Future Manpower and Personnel Information System (Future MAPMIS) project. In a concluding chapter, approaches to the use of computers in the assignment of Naval officers, particularly in the Future MAPMIS project, are analyzed. The author concludes that the approach to computer-assisted assignment taken by Future MAPMIS is appropriate, but offers suggestions and recommendations for the actual implementation of the project in the area of officer assignments.

AD-A027 239/3GA PC$5.50/MF$3.00
Naval Postgraduate School Monterey Calif
Analysis of the Correlation between Psychological Variables and U.S. Navy Officer Promotion.
Master's thesis,
John Francis Anderson, and Raiford Wilson Cooper, Jr. Jun 76, 124p

Descriptors: *Promotion(Advancement), *Officer personnel, *Psychological tests, Naval personnel, Mental ability, Personality, Executives, Correlation techniques, Computer programs, Psychology, Theses.

This thesis studies the relationship between promotion patterns in the United States Navy and psychological test data available on a group of former Naval Postgraduate School students. It is hypothesized that personality characteristics and intelligence indicators are related to promotability and from this it is inferred that these indicators can be utilized in predicting a successful Naval career.

AD-A027 259/1GA PC$5.50/MF$3.00
Naval Postgraduate School Monterey Calif
An Analysis of Group VIII Training.
Master's thesis,
Vernie Richard Coston, and Bruce Lawellin Jackson. Jun 76, 104p

Descriptors: *Seabees, *Naval training, Peacetime, Skills, Teaching methods, Combat readiness, Mathematical models, Ratings, Personnel development, Manpower utilization, Enlisted personnel, Theses, Cost effectiveness, Resource management, Construction, Effectiveness.
Identifiers: Naval enlisted classification.

This paper analyzes and compares the methods by which training requirements for SEABEES (Group VIII ratings) are determined and training resources allocated. The major observation is that two different strategies exist. CNO (OP-099) tends to be concerned with the numbers of personnel on-board and the anticipated gains and losses, whereas CINCPACFLT and CINCLANTFLT view the problem in the near time frame, being concerned with deficiencies which may degrade SEABEE readiness. The approach taken is to first provide background data on the structure of the Group VIII ratings, the manner in which these personnel are employed, and the existing systems for managing their training. Training responsibilities are identified, and problems which exist in the current systems are presented. The analysis emphasizes environmental, cost, efficiency and management control factors. (Author)

AD-A027 293/0GA PC$5.50/MF$3.00
Naval Postgraduate School Monterey Calif
A Computer-Assisted Petty Officer Assignment System for the Turkish Navy.
Master's thesis,
Celal Seyhan. Jun 76, 116p

Descriptors: *Enlisted personnel, *Computer applications, *Naval personnel, *Billets(Personnel), Turkey, Management information systems, Network analysis(Management), Flow charting, Theses.
Identifiers: *Petty officers.

A computer-assisted petty officer assignment model for the Turkish Navy has been formulated and developed. The objective of the model is to assist the personnel officer in making decisions during the petty officer assignment process. The history and the personnel organization of the Turkish Navy are described for background purposes. Data bases for personnel characteristics and billet requirements have been created. Weighting factors which affect the assignment decision have been described. In addition, the processing of the model has been described in a detailed manner and flow charts of the model have been included. Management Information System (MIS) implementation plans and a network diagram have been presented and explained. (Author)

AD-A027 294/8GA PC$4.50/MF$3.00
Naval Postgraduate School Monterey Calif
The Indoctrination Division: A Model for Effective Integration of First-Term Enlisted Personnel into the Aircraft Carrier Organization.
Master's thesis,
David Paul Mozgala. Jun 76, 74p

Descriptors: *Enlisted personnel, *Naval personnel, Aircraft carriers, Recruits, Integration, Individualized training, Division level organizations, Theses.
Identifiers: Indoctrination.

This paper proposes an indoctrination division model for processing of first-term enlisted personnel reporting aboard aircraft carriers. The model is designed to meet the needs of these individuals as adolescents as well as sailors. Theories of adolescence, problems of modern youth, and attitudes of first-term sailors are examined in order to determine the needs of the client population, and explore ways of meeting these needs. Finally, a specific indoctrination model is offered which is based on the theories discussed and the author's experience as an I-division officer aboard an aircraft carrier. (Author)

AD-A027 415/9GA PC$6.00/MF$3.00
Army Element Joint Refugee Information Clearing Office Washington D C
Joint Refugee Information Clearing Office (JRICO).
After action rept. 4 Jun 75-31 Jan 76,
Robert A. Silano. 2 Mar 76, 136p

Descriptors: *Refugees, *Southeast Asia, *Personnel management, South Vietnam, Cambodia, Laos, Relocation, United States Government, Joint military activities, Policies, Effectiveness, Assessment, Volunteers, Data bases, Data processing.
Identifiers: After action reports, Lessons learned.

This report provides an historical record of the establishment, procedures, functions, and observations of the Joint Refugee Information Clearing Office (JRICO). Its role was to expedite the Indochinese refugee sponsorship process for members of the United States military community by facilitating the location of Vietnamese, Cambodian (Khmer), and Laotian nationals who were evacuated and to disseminate sponsorship/resettlement information.

AD-A027 503/2GA PC$4.00/MF$3.00
Naval Training Equipment Center Orlando Fla
Training Characteristics of the Automated Adaptive Ground Controlled Approach Radar Controller Training System (GCA-CTS).
Interim rept. Apr 74-Apr 76,
Robert Breaux. Jul 76, 42p Rept no. NAVTRAEQUIPC-TN-52

Descriptors: *Naval training, *Air traffic controllers, *Radar operators, *Adaptive training, Ground controlled approach radar, Automation, Computer aided instruction, Teams(Personnel), Speech recognition, Human factors engineering, Naval personnel.
Identifiers: Self paced instruction.

An initial feasibility study outlined a training system for laboratory test and evaluation of an automated adaptive ground controlled approach controller training system for the precision approach radar. Evaluation of the initial system by GCA instructor led to a revision of the model and of the performance measurement system. This report concerns itself with that development process, with the current laboratory systems, and with implications for future training systems. The potential for team training by simulation of missing crew members is discussed. (Author)

AD-A027 507/3GA PC$5.00/MF$3.00
Human Resources Research Organization Alexandria Va
Team Training and Evaluation Strategies: A State-of-Art Review.
Special rept.,
H. Wagner, N. Hibbits, R. Rosenbaltt, and R. Schulz. Jun 76, 79p Rept no. HumRRO-SR-ED-76-11
Contract MDA903-76-C-0210, Grant DARPA Order-3187

Descriptors: *Teaching methods, Skills, State of the art, Feedback, Military training, Assessment, Literature surveys, Simulation, Individualized training, Classification.
Identifiers: Team training.

A critical review and evaluation of the literature was performed to describe existing instructional and evaluation techniques relevant to team training. Comprehensive documentation sources such as Educational Resources Information Center (ERIC), Defense Documentation Center (DDC), and National Technical Information Service (NTIS) were searched. In addition, the social psychological areas and the industrial training field were surveyed for relevant publications. Current studies and team training practices underway within the Services were examined and described. A classification scheme was introduced in which the training situations discussed in this review were categorized as either emergent or established. Using this classification scheme, state-of-the-art gaps in team training and evaluation were identified for needed research and development.

AD-A027 526/3GA PC$4.50/MF$3.00
Operations Research Inc Silver Spring Md
Handbook for the Development of Qualifications for Personnel in New Technology Systems.
Final rept. Jul 75-Jun 76,
Leonard A. Stoehr, and Barbara Paramore. Jun 76, 61p ORI-TR-1012, USCG-D-75-76
Contract DOT-CG-41903-A
See also AD-A026 108, AD-026 109, and AD-A026 110.

Descriptors: *Job analysis, *Aptitude tests, *Marine transportation, *Merchant vessels, Personnel selection, Liquefied natural gas, Nuclear powered ships, Marine engineering, Technology, Hazards, Cargo handling, Safety, Handbooks, Qualifications, Data management.
Identifiers: *Technology innovation, Projects, New technology.

An established method of task analysis -- Functional Job Analysis -- has been adapted for use in delineating qualifications needed by personnel in new types of vessel systems. The method was developed and applied in two demonstration projects, from which qualifications were recommended for liquefied natural gas cargo handling personnel and nuclear ship engineering personnel. The procedures address special problems involved in performing a generally applicable analysis that reflects the unique hazards and safety requirements of marine occupations. The report on the method is in handbook form. It covers definition of the new type of system, data sources, development of an analytic structure, the writing of complete task descriptions within a system function framework, and procedures for supporting the reliability and validity of the task data produced in the analysis.

AD-A027 646/9GA PC$5.00/MF$3.00
Army Command and General Staff Coll Fort Leavenworth Kans
The Army Warrant Officer Career: Toward Manager or Technician.
Final rept.,
Bradford M. Brown. 11 Jun 76, 92p
Master's thesis.

Descriptors: *Technicians, *Education, *Army training, Army personnel, Anomalies, Surveys, Management training, Officer personnel, Theses.
Identifiers: *Warrant officers, Recommendations.

The changing status of the Army Warrant Officer from inception to the present has created a situation whereby the warrant officer education system is beginning to closely parallel commissioned officer education. This seems to be occurring despite the fact that the warrant is defined as a highly skilled technician and not a high level manager. This study looks at the warrant officer career program as designed and used, and finds that the Warrant Officer Senior Course seems to continue the thread of more and more generalized education for warrant officers.

AD-A027 676/6GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Civilian Careers in Army Project Management.
Student project rept.,
Brian F. Stoll. May 75, 41p

Descriptors: *Project personnel, *Systems management, *Personnel development, Regulations, Civilian personnel, Army operations, Government employees, Weapon systems, Acquisition, Army procurement, Manpower, Career ladders, Job training, Education.
Identifiers: *Program management, On the job training, Experience.

The goals of this report are to: (1) Review Army implementation of DODD 5000.23 and other regulations/documentation related to careers in Project Management; (2) Summarize the career backgrounds of individuals currently holding positions within Army PM Offices; (3) Review Army Career management policies/procedures; (4) Explore limitations on civilian involvement in PM/PMO careers; and (5) Recommend an academic/experience path leading to civilian careers in Project Management Offices.

AD-A027 687/3GA PC$5.00/MF$3.00
Air Force Occupational Measurement Center Lackland AFB Tex
Ground Radio Equipment Repair Career Ladder AFSC's 30434, 30454, 30474 and 30496.
Occupational survey rept.
1 Jul 76, 98p Rept no. AFPT-90-304-177

Descriptors: *Electronic technicians, *Career ladders, Air Force personnel, Careers, Radio equipment, Repair, Military training, Job training, Performance(Human), Job analysis, Personnel development, Specialists, Maintenance personnel.
Identifiers: Ground radio equipment repair, Air Force Specialty codes.

This is a report of an occupational survey of the Ground Radio Equipment Repair career ladder, AFSC's 30434, 30454, 30474 and 30496 conducted by the Occupational Survey Branch, USAF Occupational Measurement center, from October 1974 through April 1976. The report describes: (1) development and administration of the survey instrument; (2) summaries of tasks performed by airmen grouped by skill level, experience level and similarity of tasks performed; (3) comparisons with current training and career field structure documents; and (4) recommended actions for further study.

AD-A027 691/5GA PC$4.50/MF$3.00
Dunlap and Associates Inc La Jolla Calif
A7E Transfer of Training Effectiveness: Device 2C15A CPT and Device 2F84B OFT/WST.
Final rept. Jun 74-Feb 76,
William J. Burger, and Clyde A. Brictson. Aug 76, 59p NAVTRAEQUIPC-74-C-0079-2
Contract N61339-74-C-0079

Descriptors: *Flight training, *Flight simulators, *Attack bombers, *Jet bombers, Transfer of training, Effectiveness, Efficiency, Instructors, Pilots, Methodology.
Identifiers: A-7E aircraft.

Training effectiveness and efficiency of two A7E aircraft training simulators was assessed within their operational training environment using a qualitative assessment method. Devices evaluated were the Cockpit Procedures Trainer (Device 2C15A) and Operational Flight Trainer/Weapon Systems Trainer (Device 2F84B). Observation of training activities, review of training syllabii and intensive interviews with 13 Phase Officers and Instructor Pilots were conducted. Results indicate that (1) both devices are effective trainers, (2) the CPT rates low on efficiency due to design and datedness of material and (3) the OFT/WST is a relatively efficient trainer. Recommendations for enhancing efficiency of both devices, especially the OFT/WST are presented along with guidelines for the design of future simulator devices. (Author)

AD-A027 701/2GA PC$8.00/MF$3.00
Illinois Univ At Urbana-Champaign Dept of Psychology
A Field Test of the PLATO IV System for Company Commander Behavioral Change Training.
Final rept. 21 Aug 74-21 Dec 75,
Jerry L. Cohen, and Martin Fishbein. Jul 76, 131p NAVTRAEQUIPC-74-C-0095-1
Contract N61339-74-C-0095

Descriptors: *Computer aided instruction, *Officer personnel, *Naval training, Behavior, Effectiveness, Recruits, Perception(Psychology), Methodology, Assessment, Attitudes(Psychology), Questionnaires, Field tests.
Identifiers: Plato 4 program, Company commanders.

A field experiment was carried out at the Recruit Training Command, San Diego, to test the effectiveness of utilizing the PLATO IV system for behavioral change training. Thirty-eight company commanders were randomly assigned to either the experimental (training) or the control (no training) group. The results showed PLATO to be a highly effective device for changing behavioral intentions. PLATO also demonstrated effectiveness in changing behaviors. (Author)

AD-A027 754/1GA PC$5.00/MF$3.00
Army Command and General Staff Coll Fort Leavenworth Kans
The Regimental System in the United States Army: Its Evolution and Future.
Final rept.,
Walter L. Mayew. 11 Jun 76, 92p
Master's thesis.

Descriptors: *Regiment level organizations, *History, *Manpower utilization, Military forces(United States), Army operations, Military organizations, Manpower, Military doctrine, Policies, Deployment, Battalion level organizations, Efficiency, Military tactics, Army training, Missions, Artillery units, Logistics support, Volunteers, Theses.

No abstract available.

AD-B007 269/4GA PC$10.75/MF$3.00
Naval War Coll Newport R I
United States Naval War College, 1919-1941: An Institutional Response to Naval Preparedness.
Advanced research paper,
Gerald John Kennedy. Jun 75, 387p
Distribution limitation now removed.

Descriptors: (*Universities, Naval training), Students, Officer personnel, Courses(Education), Missions, Doctrine, Careers, Assessment, Resources, Military tactics, Military strategy, Leadership, Policies, War games, Naval budgets, Naval operations, Planning, Preparation, History.

Identifiers: *Naval war college.

Established in 1884, the Naval War College operated until 1917 when, upon the United States' entry into the World War, it was deactivated. This early operational period was characterized by a struggle to maintain existence and to develop a distinct institutional identity while contributing to the development of American naval professionalism. The College reopened in June, 1919, under the direction of Admiral William S. Sims, USN. He and his successors worked during the interwar period to develop a naval educational institution responsive to American naval needs arising from the experience of the First World War, developments in naval strategy and tactics as well as in science and technology, and worldwide political, economic and social forces. To fulfill an evolving College mission of 'training for higher command,' Sims devised an institutional structure that endured without major permanent change throughout the interwar. During this period successive College administrators worked to assure that the College's role in naval preparedness would not be downgraded or minimized. This effort was complicated in the 1920s by arms limitation programs, public apathy and antipathy, and political and economic instability. In the 1930s administrative difficulties were further intensified by rising world-wide nationalism and militarism. By 1940 several aspects of the College program had stagnated. However, its graduates permeated the Navy command structure. Therefore, when the College's continued existence was threatened, a solution was devised--based primarily on a program of shorter, more specialized courses. (Author)

AD-B008 573/8GA PC$4.50/MF$3.00
Center for Naval Analyses Arlington VA Inst of Naval Studies
The Use of Reenlistment Bonuses,
Christopher Jehn, Samuel Kleinman, and William Shughart. 9 May 75, 75p Rept no. CNS-1050
Contract N00014-68-A-0091
Distribution limitation now removed.

Descriptors: (*Reenlistment, Motivation), (*Personnel retention, Naval personnel), Benefits, Money, Allocations, Enlisted personnel, Effectiveness, Salaries, Naval training, Cost analysis, Personnel management, Policies, Manpower, Personnel development, Careers, Decision making, Statistical analysis.
Identifiers: *Bonuses.

Reenlistment bonuses are a powerful tool for affecting the retention behavior of enlisted personnel. The proper allocation of these bonuses across ratings was found to require information the Navy does not currently possess. A technique was developed for assisting in this allocation process when the ideal information is not available. Recommendations are made for altering or improving the criteria on which bonus allocations are based. The Navy's personnel data system and future research neds are also evaluated. (Author)

HRP-0000483/0GA PC$4.00/MF$3.00
Comprehensive Health Planning Council of Southeastern Michigan, Inc., Detroit.
A Study of Continuing Education for Health Care Personnel in Detroit and Highland Park Area,
Oliver H. Wendt. 1973, 38p
Prepared in cooperation with United Community Services of Metropolitan Detroit, Mich.

Descriptors: *Health manpower education, *Continuing education, Medical personnel, Michigan, Agencies, Attitudes, Surveys, Objectives, Recommendations, Methodology, Tables(Data), Health planning.

The study of continuing education for health care personnel in the Detroit and Highland Park areas was completed in 1972, and is intended to serve as an aid in the development of a consortium for continuing education. Concerned agencies were contacted to determine their requirements and provisions for continuing education for their own personnel, as well as their attitudes toward joint planning and participation with other agencies in an areawide continuing education program. The response was largely favorable and communications links were established between the participating agencies. It is anticipated, however, that additional funding will be necessary before the consortium can become a working reality. Portions of this document are not fully legible.

PB-254 873/7GA PC$8.00/MF$3.00
Abt Associates, Inc., Cambridge, Mass.
Initial Description of the National AHEC Program.
Final rept.,
Paul Grigorieff, and Diane Kell. 28 May 76, 232p
AAI-76-76, HRA/OPE-74-2
Contract N01-MB-4-4070

Descriptors: *Health manpower education, Projects, Methodology, Health care requirements, Characteristics, Organizational theory, Data, Evaluation, Education, Distribution, Medical personnel, Surveys, Tables(Data).
Identifiers: Appendices.

The final report aggregates data on the eleven Bureau of Health Manpower (HRA-DHEW) supported Area Health Education Center (AHEC) projects in order to describe salient characteristics of AHEC's development organization and program activities that might affect program outcomes. Using the individual site reports as a base, selected characteristics of individual project activities - i.e., type, expenditures, students involved, site and sponsor organizations are analyzed and categorized. Other significant processes within the National AHEC program are clustered according to types and levels of previous experience. Final section discusses implications of this study for further evaluative activities and relevance to policy issues.

PB-254 844/4GA PC$6.00/MF$3.00
Bureau of Health Manpower, Bethesda, Md.
Proceedings of the National Conference and the Area Health Education Centers Program (3rd) Held at the Grove Park Inn, Asheville, North Carolina on Apr 25-27, 1975.
Apr 75, 132p HRA/OC-76/096,
DHEW/PUBL/HRA-76/36
Sponsored in part by California Univ., San Francisco.

Descriptors: *Meetings, *Health manpower education, Distribution(Property), Universities, Medical personnel, Regional planning, Cooperation, Professional personnel, Specialized training, Project management, Evaluation, Medical education.

The conference was sponsored by the 11 universities holding Bureau of Health Area Center (AHEC) contracts to share information and experiences about 'Decentralization and Regionalization of Health Professional Education.' All of the universities have developed AHECs which are a modification of the model proposed by the 1970 report of the Carnegie Commission entitled, Higher Education and the Nation's Health. Achievements mentioned were: preceptorship arrangements in remote areas have increased interest of medical students in primary care; the health diciplines are coming together in cooperative activities; students are acquiring clinical experience earlier. Problems encountered were: university-AHEC program strains; faculty recruitment and the need for more diverse settings for student experience. Since the Commission's report, the physician to other manpower ratio has increased and geographical maldistribution remains a problem. The AHEC program can be expected to help solve these problems and should be able to provide supporting data in 8 years. Evaluation of the programs was stressed.

PB-254 915/2GA PC$7.75/MF$3.00
American Association of Colleges of Podiatric Medicine, Washington, D.C.
A Deferred Cost of Education Plan for Podiatric Medicine.
Rept. for 17 Mar 75-16 Apr 76,
Robert A. Heil, Sidney G. Tickton, and William Kinder. Apr 76, 218p HRA/OC-76/094
Contract PHS-HRA-231-75-0202
Prepared in cooperation with Academy for Educational Development, Inc., New York.

Descriptors: *Health manpower education, *Medical education, Foot(Anatomy), Diseases, Financing, Students, Education, Universities, Tables(Data), Medical personnel, Physicians, Funds, Expenses.
Identifiers: *Podiatry, Loans, Deferred costs, Appendices.

The financing of podiatric education presents the following problems: (1) Colleges will have to expect tuition fees to cover a larger proportion of educational costs; (2) the present $35,000 cost per student will rise to $60,000 by 1980; (3) students cannot meet the increased future cost. This study develops a plan by which, first, the government would guarantee loans for all students from private lenders in return for a contract requiring the student to serve three consecutive years after graduation and residency in an underserved area, providing patient care. Second, the colleges of podiatric medicine would charge tuition and fees adequate to operate at higher quality levels and with less dependence on federal funding. Third, the loans would have terms liberal enough to provide the incentive for students to complete the service agreement. Also, the government may elect to repay the loans during the course of the service period. However, students may repay the loans in cash and forgo the service period.

PB-254 981/4GA PC$6.00/MF$3.00
Virginia Municipal League, Richmond.
Classification and Pay: A Manual for Virginia Cities, Counties, and Towns.
Final rept.
Nov 75, 141p USCSC-75-VA-01
Report on intergovernmental Personnel Act Statewide Personnel Administration, Richmond, Va. Improvement Project. 76-7. Prepared in cooperation with Virginia Association of Counties, Charlottesville, and Civil Service Commission, Philadelphia, Pa. Intergovernmental Personnel Programs Div.

Descriptors: *Job analysis, *Personnel management, *Salary administration, Classifications, Management systems, Manuals, Methodology, Salaries, Municipalities, Counties, Virginia, Questionnaires, Government employees, State government.
Identifiers: *Wage structures, *Job classification, Towns.

The purpose of this manual is to provide the classifier, the manager, and the classifier/manager with sufficient information about the language, principles, practices, and procedures of classification so that he can either draft a simple classification and pay plan, or revise a more complicated plan already in existence. The manual is geared to principally small and medium-size jurisdictions and is intended to provide users with both the why and the how of classification and pay plan development. In jurisdictions where little or no technical expertise exists in classification and pay,

the manual should be supplemented with other training materials, or onsite technical assistance.

PB-254 992/1GA PC$10.00/MF$3.00
Human Resources Research Organization, Alexandria, Va.
National Study of Social Welfare and Rehabilitation Workers, Work, and Organizational Contexts. Research Report No. 2. Effects of Agency Work Contexts: An Intensive Field Study. Volume I. Report.
Final rept.
Dec 73, 331p SRS-18-56671-001
Grant SRS-18-56671
See also Volume 2, PB-254 993.

Descriptors: *Social services, *Organizations, *Attitude surveys, Personnel management, Job satisfaction, Performance, Professional personnel, Paraprofessional personnel, Motivation, Morale, Absenteeism, Social welfare, Rehabilitation, Environments.

The report presents and describes the results of an intensive field study of the organizational contexts within which social welfare and rehabilitation work are performed and of the effects of those contexts upon that work. The principal objective was to determine the impacts of organizational structure and climate upon social welfare and rehabilitation personnel, their attitudes, and their performance. A secondary objective was to identify the attitudes of workers toward a number of specific aspects of their agencies and their work environments. Data were collected in 12 public welfare, 9 private welfare, and 10 public rehabilitation agencies throughout the nation.

PB-254 993/9GA PC$7.75/MF$3.00
Human Resources Research Organization, Alexandria, Va.
National Study of Social Welfare and Rehabilitation Workers, Work, and Organizational Contexts. Research Report No. 2. Effects of Agency Work Contexts: An Intensive Field Study. Volume II. Technical Appendices.
Final rept.
Dec 73, 225p SRS-18-56671-002
Grant SRS-18-56671
See also Volume 1, PB-254 992.

Descriptors: *Social services, *Organizations, *Attitude surveys, Personnel management, Job satisfaction, Performance, Professional personnel, Paraprofessional personnel, Motivation, Morale, Absenteeism, Social welfare, Rehabilitation, Environments, Questionnaires.

This volume contains eight appendices which supplement report 18-56671-001. They are entitled: Appendix A. Variables, Dimensions, and Scales; Appendix B. Index of Dimensions, Scales, and Items; Appendix C. Guide for Obtaining Agency Data; Appendix D. Personnel Questionnaire; Appendix E. Personnel Interview Guide; Appendix F. Demographic Results, Scale Scores; Appendix G. Tabulations of Responses; Appendix H. Summary of the National Study of Social Welfare and Rehabilitation Workers, Work, and Organizational Context.

PB-255 014/3GA PC$6.75/MF$3.00
Little (Arthur D.), Inc., Cambridge, Mass.
Costs of Hospital-Sponsored Orientation and Inservice Education for Registered Nurses.
Final rept. Jun 73-Nov 75,
Suzanne H. Kase, and Betty Swenson. Nov 75, 173p PHS/DN-73/7
Contract N01-NU-3-4082

Descriptors: *Nurses, *Health manpower education, Regression analysis, Methodology, Registered nurses, Hospitals, Specialized training, Evaluation, Nursing, Recommendations, Standards, Costs, Questionnaires, Reviews, Estimating, Design, Salaries, Tables(Data), Objectives.
Identifiers: Appendices.

The study was conducted to estimate the total national cost of in-hospital education for registered nurses. The design included analysis for differences in orientation costs for new nurses, with three types of preparation (diploma, Associate Degree, and Baccalaureate) and for cost differences in hospitals of varying sizes. Data were supplied by a stratified random sample of 394 hospitals. The total national cost of in-hospital education is estimated to be $226 million; $135 million, or 60% is for orientation and $91 million, or 40%, is for inservice education. Average total costs per sample hospital are presented as well as costs per new nurse for orientation and inservice education. Average salary costs for training staff for both orientation and inservice were calculated from the sample data; they ranged from $7,176 in the smaller hospitals to $80,062 in the largest.

PB-255 044/0GA PC$5.50/MF$3.00
Hackman (J. Richard), Bethany, Conn.
Improving the Quality of Work Life: Work Design.
Final rept. Jan 74-Apr 75,
J. Richard Hackman. Jun 75, 125p*
ASPER/CON-74/0077/A
Contract L-74-77
See also PB-255 045.

Descriptors: *Job satisfaction, *Quality of life, Attitudes, Job analysis, Efficiency, Performance, Productivity, Personnel development, Personnel management, Interpersonal relations, Organization theory, Absenteeism, Group dynamics, Feedback, Manpower utilization, Supervision, Design.
Identifiers: *Quality of worklife.

The paper attempts to advance current understanding about such questions as why work redesign is effective when it is, what goes wrong when it isn't and how the strategy can be altered to improve its general usefulness as an approach to personal and organizational change. Activation, motivation-hygiene, and job characteristic theories of work design are discussed. The job characteristics model of work motivation is used to explain how job redesign can increase productivity and employee satisfaction, by increasing the employee's experienced meaningfulness of the job, experienced responsibility, and knowledge of the results of his/her work. The importance of individual differences in skills and growth needs, organizational structure, interpersonal relationships and technology to work system redesign success is discussed.

PB-255 045/7GA PC$6.00/MF$3.00
Lawler (Edward E.), III, Pinckney, Mich.
Improving the Quality of Work Life: Reward Systems.
Final rept. Jan 74-Apr 75,
Edward E. Lawler, III. Jun 75, 130p*
ASPER/CON-74/0078/A
Contract L-74-78
See also PB-255 046.

Descriptors: *Quality of life, *Job satisfaction, *Incentives, Job analysis, Efficiency, Performance, Productivity, Salaries, Motivation, Interpersonal relations, Organization theory, Supervision, Manpower utilization, Personnel management, Attitudes.
Identifiers: *Quality of worklife.

The relationship between reward systems, the quality of work life, and organizational effectiveness is examined. In order for the quality of work life to be good, the reward system must offer a reward level high enough to satisfy the basic needs of individuals, rewards equal to or greater than those in other organizations, a distribution of rewards that is seen as fair by the members, and a provision of rewards that fit the needs of individuals. In order to promote organizational effectiveness, rewards must be perceived to be related to performance; high overall satisfaction, external equity, and higher reward level must be provided for better performers; important rewards must be related to actually coming to work; and the reward distribution pattern and decision making approach must fit the management style and organization structure. Characteristics of different reward systems and the advantages and disadvantages of different performance based pay systems in different organizational environments are discussed.

PB-255 046/5GA PC$5.50/MF$3.00
Alderfer (Clayton P.), Bethany, Conn.
Improving the Quality of Work Life: Group and Intergroup Design.
Final rept. Jan 74-Jun 75,
Clayton P. Alderfer. Jun 75, 108p* ASPER/CON-74/0080/A
Contract L-74-80
See also PB-255 047.

Descriptors: *Job satisfaction, *Quality of life, *Group dynamics, Efficiency, Performance, Interpersonal relations, Discrimination, Ethnic groups, Females, Negroes, Motivation, Productivity, Supervision, Labor unions, Attitudes.
Identifiers: *Quality of worklife.

Many approaches to group behavior in organizations fail to give an adequate account of intergroup dynamics by focusing almost exclusively on intergroup processes. This report provides a definition of the human group which gives more attention to intergroup relations than most previous concepts of group behavior. Several classical studies of group behavior are examined to detect how the original investigators dealt with intergroup dynamics, and a series of classical propositions explaining the nature of intergroup conflict are outlined. A series of specific (generational, sex, ethnic) intergroups within organizations are defined and described.

PB-255 047/3GA PC$6.00/MF$3.00
Strauss (George), Berkeley, Calif.
Improving the Quality of Work Life: Managerial Practices.
Final rept. Feb 74-Jun 75,
George Strauss. Jun 75, 127p* ASPER/CON-74/0084/A
Contract L-74-84
See also PB-255 046.

Descriptors: *Job satisfaction, *Quality of life, *Supervision, Management training, Efficiency, Performance, Productivity, Supervisors, Personnel management, Labor relations, Organization theory, Manpower utilization, Labor unions, Motivation.
Identifiers: *Quality of worklife.

This monograph is concerned with the key role management plays in determining the Quality of Work Life (QWL) through the day-to-day contacts of individual managers with members of the work force, through establishing policies and promoting an atmosphere which either inhibits or facilitates good QWL, and through its (re) design of jobs, administration of career and reward systems, and promotion of cohesive work groups. The manager must use consideration, facilitation (explained in the report in terms of expectancy theory), and participation to achieve good QWL. Structural limitations (span of control and whether the organization is organized along a functional or product line basis) and higher management attitudes influence the effectiveness of the supervisor in improving QWL, as does the attitude of the union, if one is present. Participation is

stressed as a way of improving QWL by increasing the employee's control over his job and is an important step in gaining cooperation of workers in implementing changes which may be made.

PB-255 052/3GA PC$11.75/MF$3.00
National Urban League, Inc., New York.
Work Evaluation/Work Adjustment: An Evaluation.
Final rept.,
John J. Cardwell, Jr., David Curry, and Andrew Bato. Jul 75, 435p SRS-12-55521-001
Grant SRS-12-55521

Descriptors: *Rehabilitation, *Social psychology, *Disadvantaged groups, *Employment, Adjustment(Psychology), Projects, Handicapped persons, Vocational guidance, Counseling, South Carolina, California, Social effect.
Identifiers: Work evaluation/work adjustment project, Culturally disadvantaged groups, Work adjustment, Columbia(South Carolina), San Diego(California), Vocational rehabilitation.

To demonstrate that conventional rehabilitation techniques could be used to ameliorate social barriers to employment among socially or culturally handicapped individuals, the National Urban League (NUL) developed and implemented the work evaluation/work adjustment (WE/WA) program to deal with vocational evaluation, training, and counseling as well as employment opportunities among the members of this group in Columbia, South Carolina and San Diego, California in 1972-1975. Participants were 1,493 clients, judged to be at the poverty level. Evaluation of the program was based on the client's perception of personal progress, the employment status before and after WE/WA, and the client's own feelings about the success of the project. Results showed the positive impact of traditional vocational evaluation, training, and counseling to improve employment opportunities.

PB-255 473/1GA PC$4.50/MF$3.00
Urban Inst., Washington, D.C.
Evaluation of the WIN Tax Credit: A Feasibility Study.
Final rept.,
Peter M. Greenston, and C. Duncan MacRae.
Aug 75, 64p URI-3609-01, ASPER/CON-75/0044/A
Contract DL-J-9-M-5-0044

Descriptors: *Manpower utilization, *Economic models, Employment, Income taxes, *Salaries, Incomes, Skilled workers, Unskilled workers, Statistical analysis, Information systems, Social welfare, Supply(Economics), Evaluation.
Identifiers: Work incentive program.

The objectives of this study are to determine the feasibility of implementing an expanded version of the state labor market model to simulate labor market effects of the WIN tax credit using a minimum of program data to determine the availability of program data for the estimation of a labor supply curve of WIN tax credit authorized hires, and to analyze factors affecting the spread of knowledge about the program and the employer's decision to participate. The state labor market model, partitioned into demographic skill groups, implies that wage and displacement effects originating in one or more skill groups would have their primary impact on non-WIN workers in those same groups. The WIN program micro data is currently insufficient to estimate supply curves for WIN tax credit hires. The unreliability of wage rate data and the unavailability of work effort data preclude both estimation of supply responsiveness of WIN taxcredit hires and ascertainment of WIN labor quality. Further data collection aimed at implementing the awareness-adoption framework would make it possible to predict the path of the program's growth and evaluate various promotional strategies.

PB-255 610/8GA PC$4.50/MF$3.00
Civil Service Commission, Washington, D.C. Office of Labor-Management Relations.
Labor Agreement Expirations in The Federal Government, May 1, 1976 to November 1, 1976.
Semi-annual rept.
1976, 58p USCSC/OLMR-76/12
See also PB-250 368.

Descriptors: *Labor relations, *Government employees, *Agreements, Indexes(Documentation), Time, Information retrieval, Organizations, National government, Personnel, States(United States).
Identifiers: Civil service, Expiration dates, Data files.

This publication contains chronological listings of expiration dates of Federal labor agreements which fall within the six month period from May 1, 1976 to November 1, 1976. The data have been extracted from the Labor Agreement Information Retrieval System (LAIRS), an automated data file of all Federal Service labor agreements maintained by the Civil Service Commission. Agreements expiring during this period are listed by agency. Also listed for each agreement is the location of the recognition unit covered, the number of employees covered, and the union and local number. The duration of the agreement is also shown.

PB-255 611/8GA PC$4.00/MF$3.00
Civil Service Commission, Washington, D.C. Office of Labor-Management Relations.
Multi-Unit Agreements in the Federal Government, May 1, 1976.
1 May 76, 37p USCSC/OLMR-76/13
See also PB-242 965.

Descriptors: *Labor relations, *Government employees, Indexes(Documentation), National government, Labor unions, Agreements, Classifications, Organizations, Statistical data, Negotiated contracts, Information systems, Automation, Government policies.
Identifiers: Multiunit agreements, Labor agreement information retrieval system.

This publication contains listings of Federal recognition units which are covered by a negotiated agreement covering more than one such recognition unit. The data have been extracted from the Labor Agreement Information Retrieval System (LAIRS), an automated data file of all Federal service labor agreements maintained by the Civil Service Commission. The recognitions included are listed by agency, and recognitions covered by the same agreement have the same multi-unit number within each agency. Also listed for each recognition is the CSC region in which it is located, the union and its local number, total number of employees covered by that recognition, and the expiration date and duration of the agreement.

PB-255 883/1GA PC$4.00/MF$3.00
Illinois State Dept. of Personnel, Springfield. Div. of Recruitment, Research and Test Development.
Assessment Center Feasibility Study.
Final rept.,
Terry R. Shipe. Oct 73, 44p USCSC-72-IL-01

Descriptors: *Personnel selection, *Management training, Executive ability, Leadership, Job analysis, State government, Illinois.
Identifiers: Assessment centers.

The study was conducted to evaluate the feasibility of assessment centers as selection devices for management personnel within the state of Illinois. Potential candidates for promotion to supervisory positions were sent to an assessment center where they underwent an evaluation process involving interviews, aptitude and ability tests, group problems, and individual administrative assignments. Major research findings and sources of assessment techniques are summarized in this product.

PB-255 912/8GA PC$4.50/MF$3.00
New York State School of Industrial and Labor Relations, Ithaca.
The Estimated Impact of Antidiscrimination Laws Aimed at Federal Contractors.
Final rept. Feb-Sep 75,
Morris Goldstein, and Robert S. Smith. May 75, 53p ASPER/CON-75/0040/A
Contract DL-J-9-M-5-0040

Descriptors: *Employment, *Legislation, *Social effect, *Economic surveys, Ethnic groups, Males, Females, Comparison, Government procurement, Contractors, Discrimination, Economic models, Government policies, National government.
Identifiers: *Antidiscrimination legislation, Compliance surveys.

The evaluation questions that can be answered with available data are outlined and the general approach and findings of previous studies on the same subject are discussed. A simple model of a discriminatory firm is developed that is helpful in specifying an empirically identifiable equation for estimating the impact of the contract compliance program, given current data limitations. This study attempts to determine whether the change in the relative economic position of five separate race/sex groups over the 1970-72 period was different between firms with government contracts and those without, and between firms subjected to a compliance review and those which were not. Considering the combined effect of a government contract and a compliance review, it was found that the primary gainers from the contract compliance program (during 1970-72) were black males and white males, and the primary losers were white females and other minorities, and the group left most unaffected was black females.

5J. Psychology (Individual and Group Behavior)

AD-A027 153/6GA PC$5.50/MF$3.00
University of Southern California Los Angeles Behavioral Technology Labs
On Cognitive Strategies for Facilitating Acquisition, Retention, and Retrieval in Training and Education.
Technical rept. 1 Jan-30 Jun 76,
Joseph W. Rigney. May 76, 104p Rept no. TR-78
Contract N00014-75-C-0838, ARPA Order-2284

Descriptors: *Teaching methods, *Learning, Information processing, Computer aided instruction, Instructional materials, Education, Attention, Memory(Psychology), Retention(Psychology), Motivation, Electrophysiology, Naval training, Theory.
Identifiers: Cognition.

The idea that students could be taught to be more effective learners, in distinction to being taught subject matter, is explored in relation to recent advances in the cognitive and neurosciences, with the objective of integrating information from these sources into a unified viewpoint that could serve as a roadmap for research and as a context for discussion.

AD-A027 178/0GA PC$4.00/MF$3.00
Minnesota Univ Minneapolis Dept of Psychology

Psychological Effects of Immediate Knowledge of Results and Adaptive Ability Testing.
Research rept.,
Nancy E. Betz, and David J. Weiss. Jun 76, 39p
Rept no. RR-76-4
Contract N00014-76-C-0243

Descriptors: *Feedback, *Adaptation, *Achievement tests, Mental ability, Individualized training, Motivation, Anxiety, Performance(Human), Programmed instruction, Psychological tests, Perception(Psychology), Stress(Psychology), Adaptive systems, Quick reaction, Computer aided instruction.
Identifiers: Knowledge of results, Stradaptive tests.

This study investigated the effects of providing immediate knowledge of results (KR) and adaptive testing on test anxiety and test-taking motivation. Also studied was the accuracy of student perceptions of the difficulty of adaptive and conventional tests administered with or without immediate knowledge of results. Testees were 350 college students divided into high- and low-ability groups and randomly assigned to one of four test strategies by KR conditions. The ability level of examinees was found to be related to their reported levels of motivation and to differences in reported motivation under the different testing conditions. Low-ability examinees reported significantly higher levels of motivation on the stradaptive test than on the conventional test, while the reported motivation of high-ability examinees did not differ as a function of testing strategies. The effect of knowledge of results on reported Motivation also differed as a function of ability level. These results suggest that adaptive testing creates a psychological environment for testing which is more equivalently motivating for examinees of all ability levels and results in a greater standardization of test-taking environment, than does conventional testing.

AD-A027 205/4GA PC$4.00/MF$3.00
Naval Air Development Center Warminster Pa Crew Systems Dept
Legibility of Alphanumerics at Naval Aircraft Crew Stations. II. The Effect of Font Styles and Type of Instruction on Reading Speed.
Phase rept.,
R. A. Bromberger, and P. E. York. 17 Jun 74, 46p
Rept no. NADC-74130-40
See also part 1 dated 10 Jun 74, AD-A026 952.

Descriptors: *Reading, *Alphanumeric displays, *Performance tests, Naval aviation, Instrument dials, Labels, Teaching methods, Man machine systems, Computer applications, Weapon systems.
Identifiers: Legibility, Fonts, Reading speed.

This experiment is the second of a series concerned with legibility of aircraft instruments and label legends. In the present experiment the effect of two types of instruction and four font styles on 'Absorption Time' is reported. Under one set of instructions ('Never Asked' type) the subject read two digit numbers and reported only when he had finished reading. In the other set ('How Often' type), prior to each stimulus slide, S was provided a target number and at the end of his reading was asked how often the target number appeared.

AD-A027 221/1GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Information Needs for Decision Making by Program Management Office Personnel.
Student project rept.,
David M. Wilde. Nov 75, 42p

Descriptors: *Decision making, *Management information systems, *Data management, Efficiency, Data acquisition, Officer personnel, User needs, Project personnel, Personality, Perception, Utilization, Systems management.
Identifiers: Program management.

This report examines the need for decision making information by program management office (PMO) personnel. The study defines a management framework which can identify and reduce extraneous data requirements and costs within the program office. To reduce the excess quantity and cost of data, information needs and decision making styles of PMO members should be matched. This study reviews the management information policy and criteria directed by the Department of Defense; the program office data requirements; and the recent evaluations of data management systems. An individual's personality and job requirements are compared in relation to the decision making process. Two decision making style models based upon personal data needs are described. The implications of adjusting the program office information needs to match the information needs of individual decision makers will result in deletion of reports no longer required, the identification and correction of potential decision process bottlenecks, and a reduction in program costs.

AD-A027 275/7GA PC$4.00/MF$3.00
Navy Personnel Research and Development Center San Diego Calif
Empirical Weighting of Predictors for the Naval Academy Selection Program.
Final rept. 1 Jan 75-30 Mar 76,
Idell Neumann, and Norman M. Abrahams. Jun 76, 30p Rept no. NPRDC-TR-76-37

Descriptors: *Personnel selection, *Psychological tests, *Naval training, Performance(Human), Mathematical prediction, Modification, Reliability, Optimization.
Identifiers: Predictors.

A selection composite, the Candidate Multiple, was studied for revision to find an optimal combination of present and experimental predictors. Data from three Naval Academy classes (1975-1977) were used to determine and cross validate regression weights that best predict the following criteria of success at the Academy: (1) Cumulative quality point ratio (CQPR), (2) Cumulative military aptitude rating (CMAR), (3) Choice of major (MAJOR), (4) Voluntary resignation (VR), and (5) All attrition (ATT). Zero-order validities were computed against each of the five criteria for each of seven predictors. Two composites of almost equal value were developed that exceeded the prediction obtained with the current composite.

AD-A027 295/5GA PC$4.50/MF$3.00
Naval Postgraduate School Monterey Calif
Evaluation of Human Encoding Performance with Varied Display Media.
Master's thesis,
Michael Joseph O'Keefe. Jun 76, 55p

Descriptors: *Operators(Personnel), *Performance(Human), *Coding, *Display systems, Information processing, Eye movements, Data processing, Computerized simulation, Memory devices, Symbols, Theses.
Identifiers: Encoding, Subvocalization, Short term memory, Information processing(Physiology).

The experiment measured the time within three milliseconds accuracy, required for a complex systems operator to encode information commonly presented by systems hardware displays. The categories of parameters to be researched included the following: symbology, size of font, numbers, letters, colors, words, orientation of pointers, and speed of eye movement. The data is required to enhance the capability of Hardware/Systems Simulation of current interest to the Naval Air Development Center. Twenty Naval Aviation officers were used in an Order-Free Latin Square design. Encoding times for individual variables were from .092 second for single numbers to .942 second for four letter words. (Author)

AD-A027 386/4GA PC$5.00/MF$3.00
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
A Test of Herzberg's Two Factor Theory of Job Satisfaction.
Master's thesis,
Paul A. Scoville. Jun 76, 100p Rept no. GSM/SM/76S-23

Descriptors: *Job satisfaction, *Systems management, Job analysis, Theory, Motivation, Students, Questionnaires, Algorithms, Multivariate analysis, Factor analysis, Test methods, Theses.
Identifiers: Herzberg two factor theory, Job dissatisfaction.

The purpose of this study was to test the basic premise of Herzberg's two factor theory that there exists a dichotomy between job factors such that those job factors called motivators predominately lead to feelings of job satisfaction while those factors labeled hygienes primarily lead to feelings of job dissatisfaction. The test consisted of analyzing 301 responses of students enrolled in the Air Force Institute of Technology's School of Engineering and Systems and Logistics to a questionnaire that measured the student's degree of overall satisfaction/dissatisfaction with his last job and with the Herzberg job factors as they applied to that job. The analysis centered around using the Automatic Interaction Detection algorithm, multivariate step-wise regression, and Spearman rank order correlation to try to establish relationships between (1) the job satisfaction/dissatisfaction variable and the job factor variables, (2) the factor variables and the job satisfaction variable, (3) the job dissatisfaction variable and the factor variables, (4) the motivators and the job satisfaction variable, (5) the job satisfaction variable and the hygienes, (6) the hygienes and the job dissatisfaction variable, and (7) the job dissatisfaction variable and the motivators. In each of these cases, significant relationships were defined that contradicted the two factor theory. These findings led, therefore, to an overall rejection of the Herzberg theory. (Author)

AD-A027 400/1GA PC$3.50/MF$3.00
North Carolina Univ At Charlotte Coll of Business Administration
Racial Differences in Group Effectiveness in Laboratory and Field Settings.
Final rept. 1 Feb 72-30 Jun 76,
John A. Ruhe, and William R. Allen. Jul 76, 12p
Contract N00014-75-C-0900

Descriptors: *Ethnic groups, *Social psychology, *Group dynamics, *Behavioral science, Interactions, Negroes, Caucasians, Naval personnel, Supervisors, Interpersonal relations, Attitudes(Psychology), Hypotheses, Reviews, Field tests, Race relations.
Identifiers: Dyads, Self esteem.

This report reviews and summarizes research conducted from February 1972 through June 1976. The project placed primary emphasis on advancing knowledge about the interaction which occurs in small groups of blacks and whites. The hypotheses developed from a review of the literature were tested in a laboratory situation and subsequently clarified and tested in a field situation of naval recruits.

AD-A027 428/2GA PC$3.50/MF$3.00
Yale Univ New Haven Conn School of Organization and Management

'Predicting Leader behavior from a Measure of behavioral intent'.
Technical rept.,
Arthur G. Jago, and Victor H. Vroom. Jul 76, 25p
Rept no. TR-10
Contract N00014-76-C-0024
See also Rept. no. TR-9, AD-A022 809.

Descriptors: *Leadership, *Decision making, Behavior, Response, Judgment(Psychology), Personnel management, Test construction(Psychology), Test methods, Questionnaires, Effectiveness, Assessment.
Identifiers: Vroom-Yetton tests.

A recent program of leadership research has relied on a measure of behavioral interest in thirty hypothetical decision-making cases as a surrogate for actual leader behavior in real situations. In this investigation, the validity of this instrument is examined by comparing these statements of intent with respondents' reported behavior in similar but real situations. Although apparent random error may make accurate individual predictions from a response to any single case difficult, both parametric and nonparametric analyses suggest the instrument to be predictive of actual behavior for sets of responses and therefore appropriate for testing relationships across subjects. Responses to the instrument, however, are not predictive of behavior in decision situations judged as having unsuccessful outcomes. Possible reasons for their lack of relationship in this subset of situations and methods for increasing the validity of the instrument are suggested. (Author)

AD-A027 527/1GA PC$4.00/MF$3.00
Washington Univ Seattle Dept of Psychology
The Life Experiences Survey: Preliminary Findings.
Technical rept.,
Irwin G. Sarason, and James H. Johnson. 1 May 76, 34p Rept nos. SCS-LS-001, UWDP-SCS-LS-001
Contract N00014-75-C-0905
Report on Life Stress and Coping Skills in Relation to Performance and Organizational Effectiveness.

Descriptors: *Life sciences, *Stress(Psychology), Assessment, Measurement, Change detection, Surveys, Perception(Psychology), Impact, Hypotheses, Adjustment(Psychology).
Identifiers: Experience, Coping ability, Positive or negative change.

This report describes the development of a measure of life changes, the Life Experiences Survey; and preliminary data related to this assessment instrument are presented. The RES is a 57 item scale that lists numerous events which individuals may experience and call for social readjustment. Subjects are asked to indicate events which they have experienced during the previous year and whether these events were perceived as positive or negative. Additionally, subjects are asked to rate on a 7-point scale the degree of impact these events have on their lives. From these responses it is possible to derive three life change scores: positive, negative, and total. This scale may be contrasted with earlier measures of life stress which failed to distinguish between positive and negative change and did not allow for individualized ratings of desirability of events and degrees of impact.

AD-A027 938/8GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Motion Effect on the Human Operator in a Roll Axis Tracking Task.
Andrew M. Junker, and Clyde R. Replogle. 1975, 5p Rept no. AMRL-TR-74-133
Availability: Pub. in Aviation, Space and Environmental Medicine, v46 n8 p819-822 Jun 75.

Descriptors: *Optical tracking, *Aerial warfare, Motion, Performance(Human), Simulators, Roll, Learning, Compensation, Aircraft, Human factors engineering, Reprints.

To better understand the effects of motion on tracking performance, a simulator, capable of being controlled in a static as well as motion mode, was developed. Using this simulator, 12 volunteers, separated into groups of four, attempted to track a wing angle target display. The target was driven with band-limited (0.5 rad/s) Gaussian noise so that a roll angle of 120 deg was equivalent to 1 S.D. Different control dynamics (plants) were used for each group of volunteers. For manual control of plants of the form K/S(2), the experimental results indicate that large amplitude roll motion information reduces task learning time and causes a significant improvement in tracking performance. For control of simpler plants, of the form K/S, no improvement due to the presence of the motion environment was observed. (Author)

AD-A027 673/3GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Fiedler's Contingency Model of Leadership Effectiveness: Possible Implications for a Manager.
Student project rept.,
Hugh L. Scott. May 75, 34p

Descriptors: *Leadership, *Management, *Group dynamics, Interpersonal relations, Effectiveness, Motivation, Personality, Adaptation, Personnel management.
Identifiers: Program management, Contingency leadership models, Situational factors.

The current trend within the Department of Defense is to reduce the force structure without impairing mission accomplishment. To this end, emphasis is being placed upon improving the management of people. Managers are being asked to do more with fewer personnel. If they are to be expected to achieve more with fewer people, then there should be an organized effort to provide those managers with methods to improve managing human resources. This paper briefly traces the emergence since the end of World War II of certain aspects of behavioral science as they apply to the manager. The result of the post World War II studies led social scientists to seriously consider the possibilities of the inter-action between leaders and groups in various situations as a fruitful area for extensive research. Within this general research area this paper reviews one contemporary theory, Fiedler's Contingency Model of Leadership Effectiveness, to determine its possible applicability to the program manager.

AD-A027 740/9GA PC$3.50/MF$3.00
Naval Health Research Center San Diego Calif
Invasion of Personal Space as a Function of Age, Sex, and Race.
Larry M. Dean, Frank N. Willis, and James M. La Rocco. 2 Mar 76, 10p Rept no. 75-53
Availability: Pub. in Psychological Reports, v38 p959-965 1976.

Descriptors: *Interpersonal relations, Spatial distribution, Children, Adults, Behavior, Response(Biology), Sex, Race(Anthropology), Humans, Perception(Psychology), Avoidance, Reprints.
Identifiers: *Territoriality, *Social distance, Age distribution.

Reactions to the invasion of personal space in terms of age, sex, and race of the invaders were investigated. Children, grouped by sex (male and female), race (black and white), and age (5 years, 8 years and 10 years old), invaded the personal space of 192 adults grouped by sex (male and female) and race (black and white). The six types of behavioral responses were: avoidance, aggression, exploratory behavior, facilitative behavioral, excess motor activity, and failure to respond. Responses to personal space invasion were not affected by the sex variable. Blacks responded more often than whites did, but did not differ with regard to any particular type of behavioral response. Age of the invader was found to have a significant effect upon type of response given by adults whose personal sapce was invaded. It was concluded that the age of the invader was much more important than race or sex in determining the response to invasion of personal space. (Author)

JPRS-67486 PC$6.00/MF$3.00
Joint Publications Research Service, Arlington, Va.
Forensic Psychology.
A. V. Dulov. 21 Jun 76, 146p
Trans. of mono. Sudebnaya Psikhologiya, Minsk, 1970 p7-12, 76-95, 107-166, 169-177, 183-190, 216-244, 322-335, 373-382.

Descriptors: *Social psychology, *Criminology, Education, Rehabilitation, Personality, Methodology, Psychometrics, Data acquisition, Research, Translations, USSR, Behavior, Organizations.
Identifiers: Criminal justice, Behavior modification, Forensic psychology.

Contents: Introduction to forensic psychology; Psychological structure of the administration of justice; The methods of forensic psychology; Psychological fundamentals of preliminary investigation; Psychological fundamentals of court proceedings; Psychological fundamentals of the activity of corrective labor institutions.

5K. Sociology

NTIS/PS-76/0624/7GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Quality of Life in the Urban Environment (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Mary E. Young. Aug 76, 219p*
Supersedes NTIS/PS-75/570, and NTIS/PS-74/125.

Descriptors: *Bibliographies, *Quality of life, *Urban areas, Attitude surveys, Esthetics, Recreation, Metropolitan areas, Local government, Citizen participation, Services, Community relations, Land use.
Identifiers: Social conditions, Life styles.

The attitude of people toward cities and their development and the 'quality of life' in urban areas are cited. This includes not only general studies but also reports on specific topics such as transportation, citizen involvement in neighborhood activities, housing, and social services. (This updated bibliography contains 214 abstracts, 48 of which are new entries to the previous edition.)

PB-251 010/8GA PC$15.00/MF$15.00
Herner and Co., Washington, D.C.
Child Abuse and Neglect Research: Projects and Publications.
May 76, 480p* HEWCAN-76-04
Contract DHEW-105-75-1103
Paper copy also available on subscription, North American Continent price $25.00/year; all others write for quote.

Descriptors: *Child abuse, *Research projects, *Bibliographies, Parent child relations, Injuries, Surveys, Documents, Periodicals, Indexes(Documentation).
Identifiers: *Child neglect.

The report is an extensive collection of information on child abuse and neglect research and includes informative abstracts of about 1,100 published documents and descriptions of about 110 on-going research projects. The publications are dated 1965 to 1975 and represent medical, legal, psychological, sociological, and many other viewpoints of the child abuse and neglect problem. The research projects include both federally and privately funded projects and were identified in a national survey conducted in Summer, 1975. Author and subject indexes for publications, and investigator, organization, financial sponsor, and subject indexes for projects are included.

PB-253 650/6GA PC$11.00/MF$3.00
Herner and Co., Washington, D.C.
Child Abuse and Neglect Programs.
Jun 76, 412p* HEWCAN-76-05
Contract DHEW-105-75-1103

Descriptors: *Child abuse, *Social services, Directories, Surveys, Projects, Information systems, Organizations, Counseling, Therapy.

The directory contains brief descriptions of over 1700 service-oriented child abuse and neglect programs in the United States. Administered by private and public organizations and agencies, the programs were identified through a mail survey in the summer of 1975. Services, clientele, staffing, organization, coordination, and funding of each program are described and the directory includes a program director index, organization index, and subject index.

PB-255 180/2GA PC$4.00/MF$3.00
International Personnel Management Association, Chicago, Ill.
Public Personnel and Drug Use: A Guide for Policy Development.
Final rept.,
George W. Noblit, Paul H. Radtke, and James G. Ross. 1974, 38p USCSC-74-DX-09-1
See also report dated 30 Jun 75, PB-246 686.

Descriptors: *Government employees, Personnel management, Project planning, State government, Local government, Rehabilitation, Policies, Guidelines.
Identifiers: *Drug abuse.

The report is a workbook designed for public personnel officials interested in developing and implementing a policy of nondiscrimination towards former drug abusers. The workbook contains guidelines for new policy development for the individual jurisdictions that are given.

PB-255 884/3GA PC$9.00/MF$3.00
Texas Transportation Inst., College Station.
Social Impacts: Evaluation of Highway Project Development in Urban Residential Areas.
Research rept.,
Patricia K. Guseman, Judith M. Hall, Theron K. Fuller, and Dock Burke. Apr 76, 264p* TTI-2-8-75-190-1

Descriptors: *Highway planning, *Urban planning, *Economic impact, *Urban sociology, *Social effect, Land use, Neighborhoods, Community development, Demography, Sociopsychological surveys, Predictions, Urban areas.

The report delineates key variables which may be utilized by highway planners to predict effects of a proposed route on non-users. Techniques for measuring predictive variables are also provided. The predictive factors and measurement procedures were organized as follows: Land usages and community/neighborhood form; demographic characteristics of area residents; and sociopsychological attributes of residents. Specific short-term social consequences of urban freeway construction are discussed, as well as long-term multi-disciplinary forecasting techniques.

PB-255 836/9GA PC$4.50/MF$3.00
Office of the Assistant Secretary for Planning and Evaluation (HEW), Washington, D.C.
Runaway Youth: A Status Report and Summary of Projects.
31 Mar 76, 66p* ASPE-75-038

Descriptors: *Youths, *Social services, Parent child relations, Females, Research projects, National government, State government, Local government, Regulations, Law(Jurisprudence).
Identifiers: *Runaways.

The report provides the status of the Department of Health, Education and Welfare's activities on behalf of runaway youth and their families as of March 31, 1976. This report is divided into four major sections including background information, discussion of projects supported by various offices and agencies of the Department, preliminary analyses, and preliminary conclusions based on the information reviewed to date. A listing of offices and agencies of the Department supporting runaway youth projects, a listing of projects supported under the Runaway Youth Act, summaries of individual runaway youth projects, and a bibliography of materials developed by the projects are provided in the appendices.

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-A027 349/0GA PC$3.50/MF$3.00
Walter Reed Army Inst of Research Washington D C
An Improved High Performance Liquid Chromatographic Method for Quantifying p-Aminobenzoic Acid and some of It's Metabolites,
Nesbitt D. Brown, and Edward J. Michalski. 24 Nov 75, 5p
Availability: Pub. in Jnl. of Chromatography, v121 p76-78 1976.

Descriptors: *Kidney function tests, *Liquid chromatography, Metabolites, Laboratory tests, Clinical laboratories, Test methods, Clearances, Amines, Aromatic compounds, Reprints.
Identifiers: *Para-Aminobenzoic acid, Para-Aminohippuric acid, Acetyl radicals.

The development of a relatively simple high-performance liquid chromatographic method for the analysis of p-aminobenzoic acid and some of its metabolites is reported. The method is specific for detecting and quantifying p-aminobenzoic acid, p-aminohippuric acid, N-acetyl-p-aminobenzoic acid and N-acetyl-p-aminohippuric acid. Urine and serum samples can be analyzed directly without solvent extraction and pretreatment. The method has a lower detection limit of 1 ng on column. All compounds are eluted within 12 minutes. The method is suitable for routine clinical determinations. (Author)

AD-A027 835/4GA PC$3.50/MF$3.00
Wisconsin Univ Madison Dept of Entomology
An Enzymatic Component of the Insect Blood-Brain Barrier: Implications of DAB (3,3'-Diaminobenzidine) Oxidation,
Edward J. Houk, and Stanley D. Beck. 28 Aug 75, 6p
Grant PHS-GM-07557
Availability: Pub. in Jnl. of Insect Physiology, v22 p523-528 1976.

Descriptors: *Enzymes, *Neurochemistry, Brain, Insects, Oxidation, Ganglia, Electron microscopy, Peroxidases, Amines, Oxidoreductases, Reprints.
Identifiers: Blood brain barrier, Benzidine/3-3-diamino, Ostrinia nubilalis.

The oxidation of DAB (3,3'-diaminobenzidine) was examined in intact brains of the European corn borer, Ostrinia nubilalis. The deposition of oxidized DAB was examined by electron microscopy and found to be localized in glial cells. A semi-quantitative comparison of this reaction was made in vitro between horseradish peroxidase, catalase, and insect brain. Inhibition characteristics indicate that the brain reaction is not the result of an endogenous peroxidase or catalase. The use of specific inhibitors (i.e. sesamex, tranylcypromine) indicate that this reaction could be attributed to an amine oxidase of microsomal origin.

AD-A027 621/2GA PC$3.50/MF$3.00
Naval Medical Research Unit No 2 Apo San Francisco 96263
Multipoint Inoculating Apparatus for Biochemical Determinations in Disposable Trays.
Technical rept.,
S. W. Joseph, J. F. Duncan, and W. Sindhuhardja. 1975, 5p Rept no. NAMRU-2-TR-688
Availability: Pub. in Laboratory Practice, p413-414 Jun 75.

Descriptors: *Laboratory equipment, *Inoculation, Loops, Bacteriology, Clinical laboratories, Taxonomy, Reprints.

Taxonomic characterizations of bacterial species are based, more and more, on the evaluation of large numbers of biochemical properties of many strains. For this purpose, rapid, accurate automatic devices for inoculations are needed. Such instruments are frequently financially prohibitive. For studies of Vibrio species in the laboratory, from available materials, a multiinoculating device which was highly efficient, economical, and accurate was constructed. A unique advantage of this device is that it uses a currently available pre-sterilized plastic tray, with 24 individual cups.

AD-A027 636/0GA PC$3.50/MF$3.00
Puerto Rico Univ San Juan
Biochemical, Histochemical and Electron Microscopic Study of the Subcellular Sites of Mucopolysaccharide Synthesis.
Final rept. 1 Oct 65-1 Jan 68,
Luis R. Otero-Villardebo. 1 Jan 68, 13p Rept no. MuSe-3
Contract DA-49-193-MD-2837

Descriptors: *Mucopolysaccharides, *Biosynthesis, Cells(Biology), Mucous membranes, Metabolites, Polysaccharides, Intestines, Sites, Enzymes, Sulfation, Rats, Electron microscopy, Fractionation, Swine, Centrifuge separation.
Identifiers: *Goblet cells, Golgi apparatus(Cytology).

This investigation was undertaken to develop a method for fractionation of cells secreting large amounts of sulfated mucopolysaccharides; to study the subcellular sites where intermediates metabolites and enzymes which catalyze the synthesis of sulfated mucopolysaccharides are found, and to characterize the nature of the compounds which accumulate in the Golgi apparatus during polysaccharide synthesis. Goblet cells were isolated from scrapings of exhausted colonic mucosa by trypsinizing in presence of EDTA, followed by centrifugation in a discontinuous sucrose density gradient. The fractions obtained were examined by phase contrast and electron microscopy.

PB-255 650/7GA PC$3.50/MF$3.00
Pennsylvania Univ., Philadelphia. Dept. of Anatomy and Histology.
Lung Elastin-Separation and Characterization.
Annual rept. 1 Jun 75-31 May 76,
Joel Rosenbloom. 27 May 76, 21p NIH-N01-HR-42943-2
Contract N01-HR-4-2943
See also report dated 15 Mar 75, PB-240 806.

Descriptors: *Lung, *Tissues(Biology), *Proteins, Biosynthesis, Connective tissue, Fibers, Elastic properties, Tissue culture, Cells(Biology), In vitro analysis, Biochemistry.
Identifiers: *Elastins.

The major goal of the research is to develop a biological system with which to elucidate the biosynthetic pathway of the elastic fiber in the lung. Specifically the authors seek to: (a) identify a soluble precursor of amorphous, insoluble elastin and to determine the kinetics of incorporation of this soluble form into the fiber, (b) determine whether this incorporation is via lysine-derived crosslinks, (c) separate and characterize the microfibrillar component and its rate of synthesis, (d) determine what cells synthesize elastin. Because previous analytical data showed that significant elastin biosynthesis began at about day 16-17 in the embryonic rat, this age was selected for tissue culture studies. Using this system we have shown in pulse-chase experiments with (3H) lysine that a progressively greater fraction of the incorporated (3H) lysine is incorporated into the desmosine crosslinks characteristic of elastin.

6B. Bioengineering

AD-A027 631/1GA PC$4.00/MF$3.00
Alabama Univ in Birmingham Dept of Biomaterials
Response of Combined Electrical Stimulation and Biodegradable Ceramic.
Rept. no. 1 (Annual), 1975-1976,
J. E. Lemons. 29 Dec 75, 38p
Contract DAMD17-75-C-5044

Descriptors: *Ceramic materials, *Orthopedics, *Surgical implantation, Calcium compounds, Phosphates, Biodeterioration, Stimulation(Physiology), Electricity, Porosity.

This report presents a summary of the methods and results for 8 months of the first year investigation on the kinetics and tissue response of combining biodegradable porous ceramics and electrical stimulation for the correction of surgical defects in bone. Comparisons of healing characteristics of surgical lesions along rabbit tibias (5 control, 5 tricalcium phosphate and 5 tricalcium phosphate plus electrical stimulation) at 3, 6, and 12 weeks have shown considerable promise for this synthetic biomaterial and methodology. The animal model and evaluation techniques appear quite adequate for qualitatively and quantitatively evaluating the experimental conditions. Microscopy studies of the ceramic samples from the two sources showed differences in the microstructural dimensions of the porosity. Pore size distribution measurements showed the pore dimensions to extend from below 10 to above 600 micrometers with the average near 200 micrometers. The animal surgery and post operative follow-up proved routine after several specialty techniques were developed. Radiography and necropsy showed callus development associated with the synthetic biomaterial and most of the stabilization devices were removed after 6 weeks. Biomechanical strength tests showed similar magnitude strengths at each time period with a general increase in strength with time.

N76-25639/7GA PC$5.00/MF$3.00
Case Western Reserve Univ., Cleveland, Ohio. Engineering Design Center.
Microelectronic Bioinstrumentation Systems. Proposal and Progress Report.
W. H. Ko. 15 Jun 76, 77p NASA-CR-148145
Contracts NGR-36-027-053, GM-14267

Descriptors: *Bioinstrumentation, *Microelectronics, Blood pressure, Body temperature, Electric power, Electrocardiography, Encapsulating, Radio frequencies, Telemetry, Transmission.

For abstract, see STAR 1416

6C. Biology

AD-A027 343/3GA PC$3.50/MF$3.00
Naval Medical Research Unit No 3 Fpo New York 09527
Amblyomma Loculosum (Ixodoidea: Ixodidae): Identity, Marine Bird and Human Hosts, Virus Infection and Distribution in the Southern Oceans.
Technical scientific rept.,
Harry Hoogstraal, Hilda Y. Wassef, James D. Converse, James E. Keirans, and Carleton M. Clifford. 2 Jun 75, 15p Rept no. NAMRU-3-TR-5-76
Availability: Pub. in Annals of the Entomological Society of America, V69 n1 p3-14 1976.

Descriptors: *Ticks, *Disease vectors, *Ixodidae, Arboviruses, Reservoirs, Disease vectors, Geographical distribution, Hosts(Biology), Identification, Humans, Birds, Reprints.
Identifiers: Amblyomma loculosum.

A few specimens of Amblyomma loculosum Neumann were previously recorded, with little data, from islands in the Indian Ocean an the Coral Sea. Notes for 402 adult and immature A. loculosum taken from 14 species and subspecies of marine birds, and from several humans, goats, and a lizard, on the Tanzania coast and in islands of Mauritius, Seychelles, and Cocos Keeling groups in the Indian Ocean, islands off Queensland in the Coral Sea, and the Caroline Atoll in the Pacific Ocean are presented. In the Seychelles, Aride virus, a new ungrouped arbovirus, was isolated from a pool of 2 female A. loculosum taken from the feet of a pool of 2 dead adult roseate terns. These findings point to the need to study the role of A. loculosum as a reservoir and vector of bird and human infections. The adult and immature stages are redescribed and illustrated. A vigorous colony of this 3-host tick has been established on laboratory rabbit hosts.

AD-A027 515/8GA PC$3.50/MF$3.00
Maryland Univ College Park Dept of Psychology
Near-Field Visual Acuity of Pigeons: Effects of Head Location and Stimulus Luminance.
William Hodos, Rosalind W. Leibowitz, and James C. Bonbright, Jr. 5 Mar 75, 15p
Availability: Pub. in Jnl. of the Experimental Analysis of Behavior, v25 n2 p129-141 Mar 76.

Descriptors: *Visual acuity, *Pigeons, Conditioning(Learning), Range(Distance), Vision, Luminance, Head(Anatomy), Stimuli, Near field, Reprints.

Two pigeons were trained to discriminate a grating stimulus from a blank stimulus of equivalent luminance in a three-key chamber. The stimuli and blanks were presented behind a transparent center key. The procedure was a conditional discrimination in which pecks on the left key were reinforced if the blank had been present behind the center key and pecks on the the right key were reinfofced if the grating had been present behind the center key. The spatial frequency of the stimuli was varied in each session from four to 29.5 line per millimeter in accordance with a variation of the method of constant stimuli. Data were collected at five values of stimulus luminance ranging from -0.07 to 3.29 log cd/sq.m. The distance from the stimulus to the anterior nodal point of the eye and the grating detection thresholds were used to calculate the visual acuity of the birds at each level of luminance. Acuity improved with increasing luminance to a peak value.

AD-A027 735/0GA PC$3.50/MF$3.00
Woods Hole Oceanographic Institution Mass
Seabird Observations between Dakar and Cape Town, December 1973 - January 1974.
Technical rept.,
C. P. Summerhayes. Jun 75, 9p Rept nos.
WHOI-Contrib-3597, WHOI-76-70
Contract N00014-74-C-0262
Availability: Pub. in Ostrich, v47 p55-58 Jan 74.

Descriptors: *Birds, *Population, South Atlantic Ocean, South Africa, Ocean Currents, Summer, Abundance, Distribution, Reprints.
Identifiers: Benguela current(Atlantic Ocean).

Enroute between Dakar and Cape Town during the southern summer of 1973-1974, the greatest number of species and generally the largest numbers of seabirds were seen over the productive upwelled waters of the Benguela Current off Southern Africa. The numbers of seabirds seen at this time was less than during the winter months off Southern Africa. These observations tend to confirm that the movements of migrant species are concentrated in the Benguela Current region within about 200 km of the coast, rather than over the open ocean. (Author)

N76-25758/3GA PC$6.75/MF$3.00
Texas A&M Univ., College Station. Biology Dept.
Support of In-Flight Experiments.
Final Report.
K. P. Kuchnow. 31 May 76, 175p NASA-CR-147748
Contract NAS9-13647

Descriptors: *Eggs, *Embryology, *Space laboratories, *Spermatozoa, Experimentation, Fertility, Fishes, Physiological tests, Preserving.

For abstract, see STAR 1416

N76-25759/1GA PC$3.50/MF$3.00
Old Dominion Univ., Norfolk, Va.
A Study of the Effect of Light on the Emission of Terpenes from Certain Woody Plants.
L. M. Coppedge. 1975, 16p NASA-CR-148142
Contract NGL-47-003-067

Descriptors: *Air pollution, Light (Visible radiation), *Terpenes, *Trees (Plants), Air sampling, Chemical composition, Gas chromatography, Virginia.
Identifiers: Leaves(Botany).

For abstract, see STAR 1416

N76-25865/6GA PC$3.50/MF$3.00
Cornell Univ., Ithaca, N.Y. Planetary Studies Lab.
Detection Times and Number Densities of Rare Mobile Organisms: Application to Loch Ness.
C. Sagan. May 76, 8p NASA-CR-148176, CRSR-638
Contract NGR-33-010-101

Descriptors: *Organisms, *Population theory, Extraterrestrial life, Statistical analysis, Theorems.
Identifiers: Loch Ness.

For abstract, see STAR 1416

PB-254 657/0GA PC$5.00/MF$3.00
Smithsonian Institution, Washington, D.C.

Acta Ornithologica. Volume 14, Numbers 1, 4, 5, 1973-1976.
1976, 98p
Trans. by Anatol Dangel. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Birds, *Poland, Periodicals, Ecology, Distribution(Property), Animal migrations, Translations, Tables(Data).
Identifiers: *Ornithology, Bird banding.

The present report contains the results of the Operation Baltic, obtained in the period of time from the completion of the last report (i.e., the end of 1968) until the end of 1969. In 1969 the fieldwork was carried out in spring in two camps and in fall in seven. The time expenditure and the numbers of nets and birds trapped in particular camps are given in the report referring to the tenth year of the activity of the Operation Baltic, 1969 Polish Section. In all, 38,970 birds, belonging to 110 species, were banded. A detailed list of them with the number of retraps, recoveries and bands is given in Table 1. The present report covers recoveries (on birds banded during the Operation Baltic with Polish bands) and foreign information (on birds with foreign bands trapped during the Operation Baltic, or with Polish ones put apart from the Operation). Retraps are not included.

PB-254 816/2GA PC$4.00/MF$3.00
Nebraska Univ., Lincoln. Dept. of Horticulture.
Outstate Testing of Different Species of Woody Plants.
Interim rept.,
S. S. Salac. 18 Aug 75, 46p PR-112, NE-DOR-R-76-1
Pub. as Nebraska State Dept. of Roads, Lincoln. Research Study-64-2-PR-112. Sponsored in part by Federal Highway Administration, Washington, D.C.

Descriptors: *Plants(Botany), *Nebraska, *Landscaping, Evaluation, Cultures(Biology), Propagation, Trees(Plants), Shrubs(Plants), Ground cover, Tests, Experimental data, Tables(Data), Highways.

Two studies were conducted to pursue the objectives of this study, namely: (1) outstate variety trials of different species and cultivars of trees, shrubs, and ground covers (2) native prostrate juniper trial for roadside slopes. Several species or cultivars of trees, shrubs, and ground covers were evaluated at 10 trial sites. Plantings were made from 1964 to 1967, evaluated yearly thereafter until 1970, and final evaluations of all trials were made during the 1973 growing season. Those that received consistently good to excellent ratings are listed in Tables 1, 2, 3, 4, and 5 for each of the trial sites. Those that failed to survive or perform well are listed in Tables 6, 7, and 8. The prostrate junipers were planted during the Spring of 1970 and planted on 1:3 north and south-facing slopes of interstate 80 right-of-way two miles east of the Goehner Rest Area. Two named cultivars and five selections were superior when compared with the others studied.

PB-255 122/4GA PC$4.00/MF$3.00
Squaxin Island Tribe, Shelton, Wash.
Salmon Pen Culture at Squaxin Island Indian Reservation.
Final rept.,
Jim Fraser. Mar 76, 50p
Grant EDA-07-8-01521
Sponsored in part by Bureau of Indian Affairs, Washington, D.C.

Descriptors: *Salmon, *Aquaculture, *Squaxin Island, Aquatic animals, Fishes, Tables(Data), Washington(State), Recommendations, Fisheries, Food processing, Economic analysis, American Indians.
Identifiers: *Indian reservations, Appendices.

Approximately 180,000 lbs. of pan-size salmon was produced in 1974-75 production period at a round cost of approximately $1.44/lb. with a price received to the farmer of $.72/lb. The existing pan-size industry for all salmon pen farmers has not attained the efficiency required for profitable operation. New engineered facilities, management concepts and improved fingerling quality could improve efficiency. Approximately 1.5-2% Squaxin individual net fishery catch (or 3-4000 coho) of adult coho presumed escaped from the pen as fingerlings occurred in the fall of 1974. A coho release/recapture program in cooperation with Washington Department of Fisheries could potentially realize a 4-5:1 benefit/cost ratio to the Tribe. A chum release/recapture program could potentially realize a 3-5:1 benefit/cost ratio to the Tribe. Squaxin Tribal Enterprise Plan of Operation and Squaxin Sea Farms Salmon Farm Ordinance has been established.

PB-255 314/7GA PC$4.00/MF$3.00
Environmental Research Lab., Corvallis, Oreg. Ecological Effects Research Div.
Plant Uptake of Cadmium from Phosphate Fertilizer.
Final rept. 1970-76,
John Reuss, H. L. Dooley, and William Griffis.
May 76, 47p EPA/600/3-76/053

Descriptors: *Cadmium, *Fertilizers, *Plants(Botany), Plant physiology, Recommendations, Tables(Data), Experimental data, Soils, Adsorption(Biology), Methodology.
Identifiers: Bioaccumulation, Appendices.

A preliminary investigation of selected crop plants for cadmium uptake from various sources of commercially available fertilizer was conducted under controlled greenhouse conditions in Corvallis, Oregon. Results indicated statistically significant differences in cadmium content of plant tissue as functions of fertilizer source, mode of application, tissues analyzed, and soil type. The highest level of cadmium accumulation (6 micrograms/g dry weight) was found in lettuce grown on a course textured acid soil and fertilized at the rate of 100 micrograms P/g soil with concentrated super phosphate (CSP) containing 174 micrograms Cd/g fertilizer. It was concluded that these uptakes may be of sufficient magnitude to be of biological significance to consumer organisms. Further study was recommended.

PB-255 324/6GA PC$3.50
Rhode Island Univ., Kingston. Graduate School of Oceanography.
Some Applications of Optimal Control Theory to Fisheries Management,
Saul B. Saila, and Kurt W. Hess. 1975, 14p
Marine Reprint-51, NOAA-76032602
Grant NOAA-04-3-158-3
Pub. in Transactions of the American Fisheries Society, v104 n3 p620-629 Jul 75.

Descriptors: *Fisheries, Population growth, Optimization, Management, Fishes, Ecology, Ocean environments, Marine atmospheres.
Identifiers: Aquatic ecosystems, Optimal control theory, Sea Grant program.

A review is made of some optimization techniques applied to fisheries and related problems. Explanations of optimal control theory as applied to the Schaefer or logistic model and to the Beyerton and Holt model are provided. An optimal policy for a fishery management model based on the Brody growth function is developed. The control variable in each of the above examples is the rate of fishing and the objective function is the maximum biomass yield. A method for estimating the parameters of the Brody growth function is illustrated for the albacore tuna. Copyright (c) by the American Fisheries Society, 1975.

PB-255 386/7GA PC$3.50
Hawaii Inst. of Marine Biology, Honolulu.
Growth and Life-Span of 'Octopus Cyanea' (Mollusca: Cephalopoda),
William F. Van Heukelem. Oct 72, 18p UNIHI-SG-JC-73-03, HIMB-Contrib-397, NOAA-76032305
Grant NOAA-2-35243
Pub. in Jnl. of Zoology (London), v169 p299-315 1973.

Descriptors: *Octopuses, *Growth, *Life cycles, Aquatic animals, Fishes, Mollusca, Cephalopoda, Fisheries, Aquaculture, Aquatic biology, Life span, Breeding, Hawaii.
Identifiers: *Octopus cyanea, Spawning, Sea Grant program, Reprints.

The growth of Octopus cyanea was followed from 67 to 6500 g in captivity on an ad libitum diet of live crabs. Females spawning in captivity always die after the eggs hatch. Males may mate many times with several different females but do not appear to outlive females. The species spawns throughout the year; the time of spawning is probably determined by the age of the female. Males stop growing after suckers at the edge of the web enlarge and gradually lose weight until their death, about two or three months after maximum sucker enlargement. The life-span of O. cyanea appears to be between 12 and 15 months from settlement. A growth curve is presented for the species from settling to maximum size and compared with experimental data on captive and marked, free-living animals. Free octopuses grew at rates similar to captives fed ad libitum, indicating that food was not limiting to growth in the field, and that a reasonable estimate of age could be obtained from the weight at capture. A method of marking animals by branding is described which gives lifetime scars making it possible to study the growth of individual animals released in the field.

PB-255 386/5GA PC$3.50
Hawaii Univ., Honolulu. Dept. of Botany.
Antecedent Event Influence on Benthic Marine Algal Standing Crops in Hawaii,
Maxwell S. Doty. 1971, 7p UNIHI-SG-JC-71-01, NOAA-76032312
Contract AT(04-3)-235
Pub. in Jnl. of Experimental Marine Biology and Ecology, v6 p161-166 1971.

Descriptors: *Algae, *Sea grass, Seasonal variations, Hawaii, Storm surges, Aquatic plants, Plants(Botany), Ocean environments, Benthonic zone, Aquatic biology.
Identifiers: Sea Grant program, *Marine farming, Reprints.

In non-monsoonal tropical areas, such as Hawaii, the somewhat random effects of storm waves may be the most influential environmental factors regulating the size of the harvestable frondose marine algal crop. Seasonal factors, such as light and temperature seem to be less important as judged by regression and correlation analysis. With increasing time prior to the measurement of standing crop, the influence of light steadily decreased, that of storm waves increased to within three weeks before the sampling period after which it decreased, while the effect of temperature increased throughout.

PB-255 387/3GA PC$3.50
Hawaii Inst. of Marine Biology, Honolulu.
Rearing and Larval Development of 'Siganus canaliculatus' (Park) (Pisces: Siganidae),
Robert C. May, Dan Popper, and James P. McVey. Dec 74, 15p UNIHI-SG-JC-74-20, HIMB-Contrib-455, NOAA-76032323
Prepared in cooperation with Micronesian Mariculture Demonstration Center, Palau, Western Caroline Islands. Pub. in Micronesia, v10 n2 p285-298 Dec 74.

Descriptors: *Fishes, *Fisheries, Aquatic biology, Aquaculture, Marine fishes, Larvae.
Identifiers: *Siganus canaliculatus, Sea Grant program, Rabbitfishes, *Fish hatcheries, *Mariculture, Reprints.

Eggs of the siganid fish Siganus canaliculatus, were obtained from a hormone-induced spawning, and approximately 200 larvae were reared to metamorphosis in outdoor tanks shielded from rain by a translucent roof. Water temperatures ranged from 28 to 32C. Rearing was more successful in large (5,500 liter) containers than in small (500 liter) ones. Larvae fed upon culture rotifers (Brachionus plicatilis) as well as copepods which become established in the rearing tanks. Older larvae were fed newly hatched Artemia nauplii, but larval mortality associated with this diet was observed. Larvae began to metamorphose on day 23; in general, metamorphosis took place at standard lengths between 20 and 24 mm. The overall percentage survival, from hatching to metamorphosis, was approximately 0.3 percent.

PB-255 391/5GA PC$3.50
Hawaii Univ., Honolulu. Economic Research Center.
An Approach to Evaluating Alternative Fishing Techniques in the Hawaiian Skipjack Tuna Fishery,
S. Comitini. Oct 72, 7p UNIHI-SG-JC-73-11, NOAA-76032302
Pub. in Proceedings of Indo-Pacific Fisheries Council (15th Session), Wellington, N.Z. 18-27 Oct 72 (IPFC/72/SYM 37).

Descriptors: *Tunas, *Fisheries, Fishes, Fishing, Fishing grounds, Aquaculture, Economic analysis, Hawaii.
Identifiers: *Skipjack tuna, Katsuwonus pelamis, Commercial fishing, Sea Grant program.

This paper gives a brief account of certain aspects of the development problems facing the Hawaiian skipjack tuna fishing industry. Although the industry has shown signs of stagnation, and even decline, improvements in the operating efficiency of the remaining fleet have sustained the total catch in the fishery and the catch per effective trip. The technique of break-even analysis is utilized to demonstrate that the introduction of the purse seine to replace the traditional pole-and-line method of catching skipjack tuna is economically feasible only if the catch value per trip or per day fishing is increased or the direct costs of fishing are reduced thereby.

PB-255 392/3GA PC$3.50
Hawaii Inst. of Marine Biology, Honolulu.
Collections and Submarine Observations of Deep Benthic Fishes and Decapod Crustacea in Hawaii,
Thomas A. Clarke. Dec 71, 9p UNIHI-SG-JC-72-05, HIMB-Contrib-368, NOAA-76032309
Grants NSF-GH-62, NSF-GH-93
Pub. in Pacific Science, v26 p310-317 Jul 72.

Descriptors: *Aquatic animals, *Fishes, *Crustacea, Marine fishes, Deep water, Benthonic zone, Ocean environments, Oceanographic surveys, Deep ocean vehicles, Hawaii.
Identifiers: *Decapod crustacea, *Benthic fauna, Sea Grant program, Reprints.

Depths between 150 and 400 m off Oahu, Hawaii, were surveyed by submarine, gill nets, and traps. Depth of capture or observations and other data are given for 47 species of fishes and 20 species of decapod Crustacea. Of these species, 10 fishes and five crustaceans are either undescribed or new records for Hawaii. Four other fishes collected and several others observed from the submarine are probably undescribed or unrecorded species. A large proportion of both the total number of species collected and of the new forms were taken by gill net. The gill nets are able to sample steep, rocky bottoms and obtain types of organisms inaccessible to other types of gear, particularly bottom trawls.

PB-255 393/1GA PC$3.50
Gulf Coast Research Lab., Ocean Springs, Miss.
Mesenchymal Tumors of Some Estuarine Fishes of the Northern Gulf of Mexico. II. Subcutaneous Fibromas in the Southern Flounder, 'Paralichthys lethostigma', and the Sea Catfish, 'Arius felis',
Robin M. Overstreet, and Robert H. Edwards. 1976, 9p NOAA-76032901
Grant NOAA-04-3-158-53
Pub. in Bulletin of Marine Science, v26 n1 p41-48 Jan 76. Prepared in cooperation with Air Force Medical Center, Keesler AFB, Miss.

Descriptors: *Neoplasms, *Catfishes, *Fibroma, *Fishes, Aquatic animals, Mississippi, Estuaries, Animal diseases, Etiology, Nematoda, Trematoda, Pathology.
Identifiers: Mexico Gulf, Sea Grant program, Paralichthys lethostigma, Arius felis, Flounder, Reprints.

Subcutaneous mesenchymal fibromas are described in the southern flounder and in the sea catfish collected in estuarine and marine water of Mississippi. Under the gular membrane of the flounder occurred two pseudoencapsulated tumors, whereas only a single deeply-embedded non-encapsulated one occupied an area at the base of the catfish's anal fin. Because the latter tumor had a chondromatous component, it was considered a chondrofibroma. Tumors from both fish displayed morphological similarities, including tumor cell characteristics. They contained abundant collagen, and both incorporated bony and cartilaginous spicules. The etiology of those from the flounder could be related to a philometrid nematode or a didymozoid trematode. This report represents the first describing tumors from Paralichthys lethostigma and Arius felis and one of the few involving tumors from any fishes in the Gulf of Mexico.

PB-255 409/5GA PC$3.50
Hawaii Inst. of Marine Biology, Honolulu.
Results of Tests to Investigate the Suitability of Fish Pumps for Moving Live Baitfishes,
Wayne J. Baldwin. Jan 73, 6p HIMB-Contrib-401, UNIHI-SG-JC-73-17, NOAA-76032316
Grant NSF-GH-28
Pub. in The Progressive Fish-Culturist, v35 n1 p39-43 Jan 73.

Descriptors: *Fishing, *Centrifugal pumps, *Fishes, *Handling equipment, Transferring, Survival, Systems engineering, Marine engineering, Tests, Aquaculture, Feasibility.
Identifiers: Baitfish, Nehu, Iao, Live bait wells, Fishing vessels, Stolephorus purpureus, Fish pumps, Reprints.

The initial high mortality of nehu (Stolephorus purpureus) following their transfer by bucket into bait wells aboard Hawaiian skipjack tuna (Katsuwonus pelamis) vessels is primarily a result of injuries received during capture and handling. In an effort to improve baitfish handling techniques, a series of tests with two fish pumps were conducted at the Hawaii Institute of Marine Biology. Tests were designed to examine their applicability to Hawaiian live-bait vessels and their possible use aboard future commercial fishing vessels. Successful use of fish pumps to transfer or collect live fishes has been made by Bedell and Flint, Morton, Novak and Sheets, and Robinson.

PB-255 412/9GA PC$4.00/MF$3.00
Hawaii Inst. of Marine Biology, Honolulu.
Plans for a Siganid Fish Farming Program.
Nov 72, 30p UNIHI-SG-JC-73-18, NOAA-76032315
Proposed by the Siganid Mariculture Group at the Siganid Mariculture Implementation Conference held at Hawaii Inst. of Marine Biology, University of Hawaii, Honolulu on November 1-5, 1972.

Descriptors: *Fishes, *Aquaculture, *Marine fishes, *Fishing, Aquatic biology, Objectives, Projects, Management, Economics, Production engineering.
Identifiers: Sea Grant program, Appendices, Mariculture, *Siganidae.

The paper is a proposal drawn up by the Siganid Mariculture Group. In the proposal are outlined the program objectives and activities of the Siganid Fish Farming Program. This would be a joint program in which participants from different countries in the Indo-Pacific region would be involved.

PB-255 413/7GA PC$4.00/MF$3.00
South Pacific Commission, Noumea (New Caledonia).
Expert Committee on Tropical Skipjack, Papeete, Tahiti, 25 February - 1 March 1974.
Apr 74, 30p NOAA-76032325
Also pub. as Hawaii Univ., Honolulu, Rept. no. UNIHI-SEAGRANT-JC-74-19.

Descriptors: *Marine fishes, *Tunas, Meetings, Fishing grounds, Abundance, Territorial seas, Fishing, Statistical data, Marking, Pacific Ocean.
Identifiers: Sea Grant program, Commercial fishing, Skipjack tuna.

The summary report is of the SPC Sixth Technical Meeting on Fisheries. The main topics discussed at the conference were possibilities of increasing skipjack resources. Other issues discussed were territorial problems, status of the territorial skipjack fisheries and research, catch statistics and biological data, skipjack tagging program, and baitfish. Included also in this report are appendices, a list of the participants, and a list of working papers.

PB-255 457/4GA PC$4.00/MF$3.00
Washington State Dept. of Fisheries, Olympia.
Salmon Spawning Habitat Improvement Study.
Completion rept. 1 Jul 73-31 Dec 75,
Dannis A. Wilson. Jan 76, 26p NOAA-76042001
Grant NOAA-04-4-208-53
See also COM-74-10177.

Descriptors: *Fishes, *Salmon, Reproduction(Biology), Fresh water fishes, Fishing grounds, Fisheries, Objectives, Methodology, Channel stabilization.
Identifiers: Spawning, *Habitat alteration.

The 1973-1975 Salmon Spawning Habitat Improvement Study had as its goals the development and assessment of three techniques for reclaiming and/or enhancing unproductive spawning habitat. These methods are: (1) gravel cleaning, (2) gravel replacement, and (3) streambed stabilization. All three techniques have generally proven to be effective and economical in accomplishing these goals. The emphasis from July 1974 to December 1975 was on evaluating the gravel replacement technique. The results were encouraging as egg to fry survival rates and fry production figures were significantly increased in most cases. A production program using the gravel replacement technique will be applied to a large number of small streams in the near future.

PB-255 463/2GA PC$3.50
Hawaii Inst. of Marine Biology, Honolulu.

Raising Mollies for Skipjack Bait May Eliminate Use of Frail Nehu,
W. J. Baldwin. Jan 74, 3p UNIHI-SG-JC-74-04, NOAA-76032327
Pub. in National Fisherman, Sep 74.

Descriptors: *Aquatic animals, *Fishes, *Fresh water fishes, Fisheries, Aquaculture, Fishing grounds, Tunas, Aquatic biology, Hawaii.
Identifiers: *Baitfish, *Skipjack tuna, *Sharpnose molly, Poecilia sphenops, Commercial fishing, Sea Grant program, Reprints.

In this article, the possibilities of using sharpnose mollies (Poecilia sphenops) for baitfish is discussed. The skipjack tuna industry traditionally uses anchovy but one disadvantage is that it suffers a mortality rate as high as 25 percent. Sharpnose mollies are being studied as a potential substitute for anchovy because this species is able to withstand prolonged periods of stress with few or no mortalities.

PB-255 464/0GA PC$3.50
Hawaii Inst. of Marine Biology, Honolulu.
Baitfish Can Be Kept Alive Longer on Hawaiian Skipjack Tunaboats,
Wayne J. Baldwin. 1973, 5p UNIHI-SG-JC-74-03, NOAA-76032326
Pub. in National Fisherman, v54 n6 p6,7,9, Oct 73.

Descriptors: *Fishing, *Materials handling equipment, Boats, Cargo ships, Tunas, Hawaii, Storage.
Identifiers: *Baitfish, *Nehu, *Bait wells, Skipjack tuna, Commercial fishing, Stolephorus purpureus, Sea Grant program, Reprints, Fishing vessels.

This article makes mention of an improved method of containing anchovy in the bait-wells of tunaboats. It is the most popular bait used for fishing tuna and because of the large amounts stored in the bait-wells it suffers a high mortality rate. The solutions described for reducing this mortality rate basically cover bait-well design on the vessels.

PB-255 467/3GA PC$3.50
Hawaii Univ., Honolulu.
Status, Problems, Advances and Economics of 'Eucheuma' Farms,
Maxwell S. Doty, and Vicente B. Alvarez. May 75, 7p UNIHI-SG-JC-75-09, NOAA-76032320
Grant NOAA-04-3-158-29
Sponsored in part by Marine Colloids, Inc., Rockland, Maine. Pub. in MTS Jnl., v9 n4 p30-34 Apr/May 75.

Descriptors: *Algae, *Sea grasses, *Plant reproduction, Philippines, Aquatic plants, Plants(Botany), Tables(Data), Farm crops, Economic factors, Farm management.
Identifiers: Sea Grant program, *Seaweeds, *Eucheuma, Reprints, Carrageen, *Marine farming.

The farming of Eucheuma is only practiced now in the Philippines, where it takes two forms, family farms and estate farms. This tropical red algal seaweed is a source of a galactan colloid, carrageenan, which is a key substance in today's food and dairy industries. As of mid-1974, there were over 1000 farms exporting over 600 tons per month of this dry seaweed with the likelihood that the farmed crop from this country, alone, would produce at least twice as much Eucheuma as last year's total world supply, which was nearly all from the harvest of wild crop material. Two or more kilograms of export material can be produced per man-hour if there is no significant seasonality. A newly-selected strain now being introduced may both increase the efficiency and offset the seasonality.

PB-255 470/7GA PC$3.50
Hawaii Inst. of Marine Biology, Honolulu.
Fecundity and Length at First Spawning of the Hawaiian Anchovy, or Nehu ('Stolephorus purpureus Fowler') in Kaneohe Bay, Oahu,
Daniel F. Leary, Garth I. Murphy, and Marlyn Miller. Jun 74, 11p UNIHI-SG-JC-75-12, HIMB-Contrib-457, NOAA-76033101
Pub. in Pacific Science, v29 n2 p171-180 1975.

Descriptors: *Fishes, *Kaneohe Bay, Marine fishes, Larvae, Reproduction(Biology), Seasonal variations, Environments, Fisheries, Aquatic animals, Aquaculture, Eggs, Hawaii.
Identifiers: Sea Grant program, *Stolephorus purpursus, Roundhead, Oahu(Hawaii), Spawning, Reprints.

Fecundity, length at first spawning, and spawning seasonality of Stolephorus purpureus were determined by examining preserved ovarian eggs and fish captured throughout a 4-year period. Fecundity was estimated from the number of eggs in the most advanced ovarian mode after it was determined that all these eggs hydrated and were spawned. Large variations in fecundity from year to year were attributed primarily to environmental factors whose influence on reproduction by Stolephorus purpureus has not been studied. Length frequencies of ovarian eggs were bimodal, but the smaller modes remained stationary regardless of the position of the larger modes. This was interpreted as evidence that individual fish spawned only once per year. From data on egg length versus fish length it was estimated that fish were first capable of spawning when 35 mm (standard length).

PB-255 472/3GA PC$3.50
North Carolina Agricultural Experiment Station, Raleigh.
The Relationship of Mineral Nutrients to Growth of 'Spartina alterniflora' in North Carolina: I. Nutrient Status of Plants and Soils in Natural Stands,
S. W. Broome, W. W. Woodhouse, Jr., and E. D. Seneca. Dec 74, 8p Journal Series Paper-4258, NOAA-76052418
Contract DACW72-72-C-0012, Grant NOAA-04-3-158-40

Descriptors: *Minerals, *Grasses, *Plant growth, *North Carolina, Plant nutrition, Nutrients, Plants(Botany), Regression analysis, Estuaries, Plant tissues, Soils, Biological productivity, Phosphorus, Magnesium, Sulfur, Soil fertility.
Identifiers: *Spartina alterniflora, Cordgrass, Sea Grant program, Reprints, Salt marshes.

Multiple regression analysis was utilized to examine relationships between nutrient concentration in the plant tissue and/or nutrient status of the soil and differences in productivity of Spartina alterniflora, among marshes and between height zones within marshes. The tall and short height zones of seven natural stands of S. alterniflora were sampled three times during the growing season. These stands were representative of variations in latitude, tide range, and type of substrate which occur along the North Carolina coast. Results indicated that plant tissue concentrations of several nutrients and several soil properties were significantly associated with variations in yield and height of S. alterniflora. Important variables positively associated with yield included P concentration in the plant tissue and in the soil. Variables negatively associated with yield included salinity of the soil solution. Mn concentrations in the plants and soil, and S concentrations in the plants. Regression equations for predicting standing crop of nutrients from dry weight of the grass are also presented.

PB-255 483/0GA PC$3.50
North Carolina Agricultural Experiment Station, Raleigh.
The Relationship of Mineral Nutrients to Growth of 'Spartina alterniflora' in North Carolina: II. The Effects of N, P, and Fe Fertilizers,
S. W. Broome, W. W. Woodhouse, Jr., and E. D. Seneca. Dec 74, 8p Journal Series Paper-4259, NOAA-76052416
Contract DACW72-72-C-0012, Grant NOAA-04-3-158-40
Also pub. as North Carolina Univ. Sea Grant reprint no. 87.

Descriptors: *Minerals, *Grasses, *Plant growth, *North Carolina, Plant nutrition, Nutrients, Plants(Botany), Estuaries, Plant tissues, Soils, Minerals, Biological productivity, Soil fertility, Nitrogen, Phosphorus, Iron, Tables(Data).
Identifiers: Sea Grant program, *Spartina alterniflora, Cordgrass, Reprints, Salt marshes.

The effect of nutrient supply on the productivity of (Spartina) alterniflora was evaluated by applying fertilizer materials to plots in natural marshes and on S. alterniflora seeded and transplanted on dredge spoil. In a marsh growing on a sandy substrate, additions of N alone increased yields of aboveground shoots significantly, and when P was also added, the yield increased about threefold. In a marsh growing on finer textured sediments, N fertilizer doubled the yield of short S. alterniflora, but there was no response to P. There was no growth response to applications of Fe. Lack of N is apparently one of a combination of factors which is responsible for producing the short form of S. alterniflora. Applications of N and P fertilizers also enhanced growth of seedlings and transplants which were artificially established on dredge spoil. Fertilization may be beneficial in propagating S. alterniflora salt marsh on dredge spoil since establishing a full vegetative cover rapidly is important. Response of seedlings or transplants to fertilizer would depend on the inherent fertility of the substrate material.

PB-255 804/3GA PC$3.50
Oregon State Univ., Newport. Marine Science Center.
Improved Flowing Water Apparatus for the Culture of Brachyuran Crab Larvae,
David V. Buchanan, Michael J. Myers, and Richard S. Caldwell. 17 Jun 75, 7p ORESU-R-75-014, NOAA-76040607
Contract EPA-68-01-0188, Grant NOAA-04-3-958-4
Also pub. as Oregon Agricultural Experiment Station, Corvallis, Technical Paper-3991. Pub. in Jnl. of the Fisheries Research Board of Canada, v32 n10 p1880-1883 1975.

Descriptors: *Crabs, *Crustacea, *Aquaculture, Aquatic biology, Shellfish, Larvae, Fishes, Cultures(Biology), Tables(Data), Bioinengineering, Equipment.
Identifiers: *Brachyura, Cancer magister, Sea Grant program, Dungeness crab, Reprints, Recirculating flow.

A flowing water system is described for culture of brachyuran crab larvae. This system, which is suitable for toxicant exposure studies, employs a flow reversal principle, and a minimal area of screen placed low on the side of the culture containers. The design minimizes the problem of larval entrapment in water exit screens. Survival of Cancer magister zoeae in rearing tests lasting up to 60 days compared favorably with survivals obtained previously using static culture methods.

PB-255 804/7GA PC$3.50
Gulf Coast Research Lab., Ocean Springs, Miss.
Mesenchymal Tumors of Some Estuarine Fishes of the Northern Gulf of Mexico. I. Subcutaneous Tumors, Probably Fibrosarcomas, in the Striped Mullet, 'Mugil cephalus',
Robert H. Edwards, and Robin M. Overstreet. Jan 76, 9p NOAA-76032902

Grant NOAA-04-3-158-53
Prepared in cooperation with Air Force Medical Center, Keesler AFB, Miss. Pub. in Bulletin of Marine Science, v26 n1 p33-40 Jan 76.

Descriptors: *Neoplasms, *Fishes, *Fibrosarcoma, Pathology, Animal diseases, Aquatic animals, Water pollution, Etiology, Mississippi Sound.
Identifiers: Reprints, Mugil cephalus, Mullets, Water pollution effects(Animals), Comparative pathology.

Reported is the occurrence of fibrous tumors occurring in the subcutaneous tissues of five striped mullet taken from Mississippi Sound. These nonpedunculated tumors were associated with ulceration of the overlying integument. Affected mullet exhibited 1 to 10 tumors on most surface-areas of the body, excluding the fins. Consisting primarily of fibroblast-derivatives, these well- to poorly-differentiated tumors are considered pathologically malignant, i.e., fibrosarcomas. Invasion into and nearly through the fascia overlying the muscle, focal necrosis, and cellular atypia support this interpretation. Metastases were not observed. Thus, these tumors could represent benign fibromatoses or fibromas. A possible relationship between these neoplasms in the mullet and increasing pollution in Mississippi Sound is suggested.

PB-258 074/6GA PC$3.50
North Carolina Univ. at Wilmington. Dept. of Biology.
First Record of the Roseate Tern Nesting in North Carolina.
James F. Parnell, and Robert F. Soots. 25 Jan 74, 2p Sea Grant Reprint-92, NOAA-76052412
Grants NOAA-2-35178, NOAA-04-3-158-40
Prepared in cooperation with Campbell Coll., Buies Creek, N.C. Dept. of Biology. Pub. in The Chat, v39 n1 p20 1975.

Descriptors: *North Carolina, *Birds, Animal behavior, Animal ecology, Reproduction, Breeding.
Identifiers: Sterna dougallii, Sea Grant program, Tern, Sea gulls, Reprints.

The article reports the sighting of the Roseate Tern nesting in North Carolina. The article gives a brief history of locations where these birds have been known to nest in North Carolina.

PB-258 079/5GA PC$3.50
North Carolina Univ. at Wilmington. Dept. of Biology.
Caspian Tern Nesting in North Carolina.
James F. Parnell, and Robert F. Soots. 1 Aug 75, 2p Sea Grant Reprint-91, NOAA-76052413
Grants NOAA-2-35178, NOAA-04-3-158-40
Prepared in cooperation with Campbell Coll., Buies Creek, N.C. Dept. of Biology. Pub. in The Chat, v40 n1 p14 1976.

Descriptors: *Birds, North Carolina, Reproduction, Tables(Data), Animal behavior, Animal ecology, Breeding, Oregon Inlet.
Identifiers: Reprints, *Tern, Sea gulls, Sea Grant program, Hydroprogne caspia.

The article reports the finding of tern nests in the Oregon Inlet on North Carolina's outer banks. Included is a table of Caspian Tern nesting data.

PB-258 881/1GA PC$3.50
Washington Univ., Seattle. Coll. of Fisheries.
Life History Observations on the Puget Sound Rockfish, 'Sebastes emphaeus', (Starks, 1911),
Lawrence L. Moulton. Apr 76, 7p WSG-TA-75-12, Contrib-420, NOAA-76051905
Grant NOAA-04-3-158-42
Pub. in Jnl. of the Fisheries Research Board of Canada, v32 n8 p1439-1442 1975.

Descriptors: *Marine fishes, *Life cycles, *Growth, Reproduction(Biology), Fecundity, Abundance, Size determination, Acclimatization.
Identifiers: Reprints, Sea Grant program, Sebastes emphaeus.

Large concentrations of Puget Sound rockfish (Sebastes emphaeus) were found at three locations in the San Juan Islands, Washington, at depths ranging from 10 to 25 m. Spawning females were found in August and September, the latest maturing Sebastes in this region. The existence of ripe females indicates that the taxon is not the juvenile form of another species. Total lengths of mature females ranged from 130 to 179 mm, and wet weights from 21 to 79 g. Fecundity estimates ranged from 20,177 for a 150-mm female to 57,103 for a 179-mm specimen. The age at maturity ranged from age II to age IV. Field and aquarium behavioral observations indicate that the species is adapted to crevice and cave existence in areas of strong currents and rocky substrate.

PB-258 088/8GA PC$3.50/MF$3.00
National Marine Fisheries Service, Highlands, N.J. Sandy Hook Lab.
Summer Benthic Fish Fauna of Sandy Hook Bay, New Jersey.
Stuart J. Wilk, and Myron J. Silverman. Jan 76, 24p NOAA-TR-NMFS-SSRF-698, NOAA-76032401

Descriptors: *Marine fishes, *Benthonic zone, *Sandy Hook Bay, Abundance, Size determination, Age, Spatial distribution, Animal behavior, New Jersey.
Identifiers: *Pseudopleuronectes americanus, Prionotus evolans, Scophthalmus aquosus, Prionotus carolinus.

Thirty-eight species and 25 families of fishes were captured during an otter trawl survey in Sandy Hook Bay, N.J., during July to October 1970. Distribution, abundance, length and age composition, and environmental preferences were analyzed for the more numerous species. Winter flounder, Pseudopleuronectes americanus; striped searobin, Prionotus evolans; windowpane, Scophthalmus aquosus; and northern searobin, Prionotus carolinus, accounted for 68.3 percent by number and 66.4 percent by weight of the total survey catch.

6E. Clinical Medicine

AD-A027 173/4GA PC$4.00/MF$3.00
Pan American Health Organization Washington D C
Surveillance and Research on Infectious Diseases Along the Trans-Amazon Highway.
Final rept. Jun 71-Jun 75,
F. P. Pinheiro, G. Bensabath, Z. C. Lins, A. H. P. Andrade, and H. Fraiha. Jun 75, 34p
Contract DADA17-71-C-1084
Prepared in cooperation with Instituto Evandro Chagas, Belem (Brazil). Fundacao Instituto Oswaldo Cruz.

Descriptors: *Infectious diseases, *Tropical medicine, Tropical regions, Leptospira, Epidemiology, Shigella, Ecology, Hepatitis, Arboviruses, Antibodies, Disease Vectors, Serology, Wildlife, Viruses, Leishmaniasis, Parasitic diseases, Entomology, Reservoirs, Humans, Brazil.

The Evandro Chagas Institute, Belem, which has been studying infectious diseases in the Amazon region for over 30 years, therefore decided to carry out epidemiological and ecological investigations in March of 1971 aimed at identifying and describing present and potential problems in the Amazon. Field trips were undertaken to 10 different areas along the Trans-Amazon and Santarem-Cuiaba highways to capture and examine wild animals and vectors for the detection of foci of zoonotic disease. Specific serologic surveys were also planned, and a leishmania skin-test survey including children and adults was carried out.

AD-A027 174/2GA PC$4.00/MF$3.00
Army Medical Research Unit (Kenya)
Studies on African Trypanosomiasis.
Final rept. 1 Sep 75-30 Jun 76.
30 Jun 76, 33p

Descriptors: *Trypanosomiasis, Antigens and antibodies, Epidemiology, Bovines, Pathology, Humans, Variations, Comparison, Hematology, Histology, Immunity, Sex, Blood Analysis, Africa.
Identifiers: Trypanosoma rhodesiense, Trypanosoma Brucei, Trypanosoma congolense, Age distribution, Kenya.

Isolates of T. rhodesiense were collected from patients in Lambwe Valley, South Nyanza, Western Kenya. Parasites of the T. brucei group were also collected from cattle in the same area. When these parasites were tested by neutralization with antisera collected from bovines which had undergone long term infections with various isolates, 15 of 21 T. rhodesiense isolates reacted with same antiserum idicating antigenic similarites which had persisted since 1970. When isolates from cattle were tested 5 of 25 reacted with the same antiserum used in the T. rhodesiense tests. Isolates of T. rhodesiense from Ethiopia and Tanzania were not neutralized by this antiserum. Some isolates of T. rhodesiense have been found to be pathogenic for cattle. Trypanosomes isolated from humans produced disease in cattle which was characterized by fever, weight loss, increased gamma globulin levels, pleocytosis and central nervous system disorders. Continuing the study of anemia in T. congolense infected cattle, we have found that early in the course of disease there is an increase in mean corpuscular volume and mean corpuscular hemoglobin while the mean corpuscular volume and mean corpuscular hemoglobin while the mean corpuscular hemoblobin concentration does not change. Preliminary results indicate that a consumptive coagulopathy also occurs during the course of infection, with thrombocytopenia, extended partial thromboplastin times and positive protamine paracoagulation tests.

AD-A027 197/3GA PC$3.50/MF$3.00
Army Inst of Dental Research Washington D C
Effects of Solutions Used to Treat Dental Fluorosis on Tooth Permeability.
Final rept.,
Robert E. Griffin, Marvin F. Grower, and William A. Ayer. Jun 76, 20p

Descriptors: *Teeth, *Bleaching agents, Stains, Fluorides, Tetracyclines, Dental pulp, Penetration, Permeability, Dental enamel, Hydrogen peroxide, Hydrogen chloride, Simulation, Saline solution, Dentin, Radioactive isotopes, Labeled substances, Statistical analysis.
Identifiers: Mcinnes solution.

Four solutions (h2O2, HCL, Mcinnes solution, and saline) were tested for their ability to penetrate through intact enamel and dentin into the pulp chamber of groups of 10 extracted non-carious teeth. None of the solutions tested appeared to penetrate the enamel and dentin into the pulp chambers as determined by the penetration of tracer amounts of the radioisotope p(32) into saline placed in the pulpal chambers. Visual observations showed that both HCL and Mcinnes solution etched the enamel sufrace, but did not increase the permeability of the enamel and dentin as determined by soaking the teeth in I(125) labeled saline. (Author)

AD-A027 210/4GA PC$3.50/MF$3.00
Kentucky Univ Lexington Dept of Community Medicine
Effective Smallpox Immunization of Young Adults.
Final technical rept.,
Abram S. Benenson, and Irving A. Phillips. Jul 76, 23p
Contract N00014-73-A-0385-0002

Descriptors: *Vaccinia virus, *Immunization, Vaccines, Response(Biology), Morbidity, Adults, Hemagglutination tests, Serodiagnosis, Antibodies, Military personnel, Virus diseases, Tables(Data).
Identifiers: *Smallpox.

The study defines the adverse reactions associated with primary immunization of young adults, their frequency and resulting morbidity, develops effective immunizing techniques associated with minimal morbidity, and develops diagnostic techniques permitting rapid recognition of smallpox.

AD-A027 244/3GA PC$6.00/MF$3.00
Naval Postgraduate School Monterey Calif
An Analysis of National Health Planning and Resource Development Act of 1974 and Its Impact on Health Care Delivery.
Master's thesis,
William Clare Truesdell, Jr., and Marshall Sol Duny. Jun 76, 146p

Descriptors: *Public health, *Medical services, Federal law, Theses, Health care facilities, Planning, Costs, Social welfare, Insurance, Civilian personnel, Military personnel.
Identifiers: Peer review, *National health planning, Medicare, Health care delivery, Legislation.

This thesis examines the National Health Planning and Resource Development Act of 1974 (1974 Act). Some of the previous major Federal legislation in health planning and resource development are summarized. Problems created due to the previous legislation are discussed. Reasons given by Congress for the passage of the 1974 Act are investigated in depth. Descriptions of the organizational components, their functions, duties and responsibilities are given. Possible impacts upon the civilian and military health care delivery systems are suggested. (Author)

AD-A027 348/2GA PC$3.50/MF$3.00
Walter Reed Army Inst of Research Washington D C
Host Defenses in Experimental Scrub Typhus: Histopathological Correlates,
Phillip J. Catanzaro, Akira Shirai, Paul K. Hildebrandt, and Joseph V. Osterman. 31 Jul 75, 15p
Availability: Pub. in Infection and Immunity, v13 n3 p861-875 Mar 76.

Descriptors: *Rickettsia Tsutsugamushi, Peritoneum, Histology, Mice, Immunity, Phagocytes, Lethality, Antibodies, Pathology, Strains(Biology), Reprints.
Identifiers: Scrub typhus.

Intraperitoneal (i.p.) infection of BALB/c mice with 1,000 50% mouse lethal doses of the Karp strain of Rickettsia tsutsugamushi was inevitably lethal, and associated pathological alterations were confined to the peritoneal cavity. Under two circumstance, i.p. infections with R. tsutsugamushi were not lethal: (1) Infection with 100 50% mouse infectious doses of the Gilliam strain, which, in fact, resulted in immune protection against otherwise lethal Karp challenge; and (2) Karp infection of animals immunized with the Gilliam strain. It was concluded that the survival of an animal bearing an i.p. infection of scrub typhus depended on its ability to concentrate a sufficiently vigorous immune response in the peritoneal cavity, resulting in the evolution of rickettsiacidal macrophages capable of suppressing the infection.

AD-A027 350/8GA PC$3.50/MF$3.00
Walter Reed Army Inst of Research Washington D C
Procoagulant and Platelet Aggregating Properties of Antilymphocyte Sera,
Daniel B. Kimball, Jr., Fredrick R. Rickles, Jon P. Gockerman, Brack G. Hattler, and Jimmy A. Light. 12 May 75, 16p
Availability: Pub. in Jnl. of Laboratory and Clinical Medicine, v87 n5 p868-881 May 76.

Descriptors: *Antilymphocyte serum, Blood platelets, Blood coagulation, Antigens and antibodies, Physiological effects, Collagen, Reprints.

Ten anti human lymphocyte sera in clinical use at six transplant centers and five anti nonhuman lymphocyte sera were studied for their procoagulant and platelet aggregating properties. The procoagulant from this serum shortened the clotting times of individual samples deficient respectively in factors XII, XI, IX, X, VIII, and VII. Esterolytic activity demonstrated on the substrate benzoylarginine ethyl ester, was completely inhibited by phenylmethylsulfonyl fluoride, but coagulant activity was variably affected. The platelet aggregating activity (PAA) has been identified as a complement fixing gamma G antibody that was adsorbed from the antilymphocyte serum (ALS) with human spleen lymphocytes. Five of the ten anti human lymphocyte sera showed varying procoagulant activity (PCA), and six sera demonstrated PAA. Three sera contained both activities. The presence of both PCA and PAA in the same preparation may predispose patients to thrombotic events, particularly if administered intravenously.

AD-A027 391/2GA PC$7.50/MF$3.00
Letterman Army Medical Center San Francisco Calif
Present Concepts in Internal Medicine, Cardiology Symposium, 1976,
Gabriel Gregoratos, Lottie B. Applewhite, and Cathleen E. Swee. 1976, 197p
See also report dated Apr 74, AD-A002 547.

Descriptors: *Cardiology, *Internal medicine, *Meetings, *Arrhythmia, Cardiovascular diseases, Chemotherapeutic agents, Drugs, Cardiovascular agents, Pathology, Physiology, Therapy, Electrocardiography, Diagnosis(Medicine), Electrolytes(Physiology), Tables(Data).
Identifiers: Cardiac assist devices, Cardiac pacemakers.

The symposium consists of ten articles and three tables (for quick reference). It focuses on the management and treatment of cardiac arrhythmias. It is designed for use by interns and residents who are faced with treating pathients with arrhythmias. This monograph is a compilation of up-to-date information on available antiarrhythmic agents. The lead article presents a summary of current knowledge about the electrophysiologic genesis of arrhythmias. The succeeding six articles discuss the various antiarrhythmic agents: lidocaine, quinidine and procaine amide, diphenylhydantoin, beta-blocking agents, digitalis, and some miscellaneous agents. Articles on electrolytes, pacemakers, and cardioversion conclude the 192 page symposium.

AD-A027 463/9GA PC$3.50/MF$3.00
Naval Dental Research Inst Great Lakes Ill
Demonstration of Salivary Antibodies by Latex Spheres as Immunologic Markers.
Research progress rept.,
George R. Riviere, William R. Cotton, and James L. Derkowski. Jun 76, 13p Rept no. NDRI-PR-76-05
Contract N00014-71-C-0134
Pub. in Scanning Electron Microscopy/1976, Pt5 p67-74 Apr 76: Proceedings of the Workshop on Advances in Biomedical Applications of the SEM (IIT Research Inst., Chicago, Ill.) Apr 76.

Descriptors: *Antibodies, *Saliva, *Streptococcus mutans, *Immunology, Bacteria, Immunoglobulins, Dental caries, Markers, Latex, Electron microscopy, Test methods.
Identifiers: Immunoglobulin A, Scanning electron microscopy.

The report describes the adaption of a recently introduced technique combining the scanning electron microscope (SEM) and an indirect labeling technique to demonstrate the binding of salivary antibodies to Strep. mutans. The procedure is dependent upon the principle that polystyrene latex beads coated with specific antibodies will attach to target antigens; whereas, beads coated with non-specific antibodies will not attach.

AD-A027 493/6GA PC$3.50/MF$3.00
Naval Medical Research Unit No 3 Fpo New York 09527
Optic Atrophy Following Measles Encephalitis.
Technical scientific rept.,
L. S. Hanna, M. W. Yassin, N. I. Girgis, A. Hassan, and Y. Safwat. 1975, 7p Rept no. NAMRU-3-TR-1-76
Availability: Pub. in Jnl. of the Egyptian Medical Association, v58 n3-4 p122-126 1975.

Descriptors: *Measles viruses, *Encephalitis, *Blindness, Atrophy, Treatment, Diagnosis(Medicine), Autopsy, Laboratory tests, Eye, Case studies, Ophthalmology, Histology, Egypt, Reprints.

The serious complication of optic atrophy was seen in a patient suffering from measles encephalitis. As there was no previous history of measles rash, the patient was diagnosed only histopathologically. The autopsy was typical of post-measle encephalitis.

AD-A027 498/5GA PC$3.50/MF$3.00
Army Medical Intelligence and Information Agency Washington D C
Studies of Mortality in Burn Cases (Undersogelser over Dodeligheden ved Forbraendinger),
Poul Luetken. 22 Jun 76, 9p Rept no. USAMIIA-K-6383
Trans. of Danish language publication Ugeskrift for Laeger, v91 p409-412, 15 Apr 37.

Descriptors: *Burns(Injuries), *Mortality rates, Skin(Anatomy), Patients, Hospitals, Lethality, Death, Signs and symptoms, Statistics, Case studies, Classification, Translations, Denmark.
Identifiers: Age distribution.

Following Chief Physician Jerald's paper at the 12 March 1935 meeting of the Medical Society, it was decided that all the copious material of the case records of burn cases treated at Rudolph Berghs Hospital would be processed and published with more detail, and that this could be done in a paper. The following is a survey of the chief results of that work. Nearly all of the earlier workers on burn cases have given summarized data of the number of cases, the number of deaths, and the calculated lethality. The purpose of the present study is to give the extent and nature of burns and to find the mortality in relation thereto. The available material comprises 1574 patients admitted in the period from 1 July 1916 to 1 July 1935. Of these, 110 died in the hospital and 2 after transfer to other hospitals. In summary, this gives a lethality of 7.1%.

AD-A027 629/7GA PC$3.50/MF$3.00
School of Aerospace Medicine Brooks AFB Tex
The Dietary Prevention of Atherosclerosis and Coronary Heart Disease.
Final rept. Jun 70-Jun 76,
Victor F. Froelicher. Jun 76, 22p Rept no. SAM-TR-76-23

Descriptors: *Preventive medicine, *Coronary disease, *Atherosclerosis, *Cholesterol, Diet, Nutrition, Risk, Cardiovascular diseases, Fats, Morbidity, Mortality rates.
Identifiers: Health risks.

Atherosclerosis is a disease in which fat deposits, fibrous tissue, blood elements, and calcium form a mushy, hard deposit within arterial walls. The result is a reduction of the lumen of arteries. In turn, this narrowing of the internal diameter of arteries limits the flow of blood which supplies nutrients and oxygen to the body tissues. Limiting the blood flow results in an inadequate supply of these necessary factors for tissue function and also allows the stagnation of toxic metabolic byproducts. The outcome can be tissue dysfunction, sometimes pain and, ultimately, tissue death. This sequence explains how atherosclerosis is responsible for such manifestations as heart attacks, heart failure, angina, strokes, and sudden death. In the United States alone, about one million persons, one-fifth of whom are less than 65 years of age, die from atherosclerosis each year. Younger individuals are being affected and great morbidity results. The recommended dietary changes are therefore logical and reasonable steps to take in order to decrease the terrible toll from this disease.

AD-A027 568/5GA PC$3.50/MF$3.00
Naval Aerospace Medical Research Lab Pensacola Fla
Establishment of Normal Electrocardiographic Values for Rhesus Monkeys (Macaca mulatta) Under Sedated and Unsedated Conditions.
James L. Kupper, Matthew J. Kessler, and John D. Clayton. 23 Apr 76, 12p Rept no. NAMRL-1226

Descriptors: *Electrocardiography, Normal distribution, Heart, Rhesus monkeys, Statistical analysis, Sedation, Value.

In an attempt to establish normal electrocardiographic values for sedated and unsedated rhesus monkeys at this laboratory, electrocardiographic tracings from 57 female and 56 male rhesus monkeys under sedated and unsedated states were examined to determine normal values for the various parameters. The data were statistically analyzed for significant differences between sex groups and sedated versus unsedated monkeys of the same sex. The results are compared with two previous major electrocardiographic studies on unsedated rhesus monkeys. (Author)

AD-A027 607/1GA PC$3.50/MF$3.00
Naval Medical Research Unit No 2 Apo San Francisco 96263
Observations on the Host-Parasite Relations between 'Echinostoma revolutum' and Lymnaeid Snails.
Technical rept.,
Chin-Tsong Lo, and John H. Cross. 26 Oct 75, 16p Rept no. NAMRU-2-TR-691
Availability: Pub. in Chinese Jnl. of Microbiology, v8 p241-252 1975.

Descriptors: *Intestinal parasites, Cercariae, Hosts(Biology), Life cycles, Growth(Physiology), Distribution, Larvae, Behavior, Sizes(Dimensions), Reprints.
Identifiers: *Lymnaeid snails, *Echinostoma revolutum, Lymnaea ollula, Lymnaea swinhoei, Metacercariae.

Echinostoma revolutum from Taiwan was studied in lymnaeid snails at 29 + or - 0.5 C. Given 3-5 miracidia, 95% of Lymnaea ollula and 40% of Lymnaea swinhoei became positive; the prepatent periods were 18 and 25 days, respectively.

AD-A027 608/9GA PC$3.50/MF$3.00
Naval Medical Research Unit No 2 Apo San Francisco 96263
Toxoplasmosis in Man and Animals in South Kalimantan (Borneo), Indonesia.
Technical rept.,
Philip T. Durfee, John H. Cross. 12 Jul 75, 11p Rept no. NAMRU-2-TR-692
Availability: Pub. in the American Jnl. of Tropical Medicine and Hygiene, v25 n1 p42-47 Jan 76.

Descriptors: *Toxoplasma, Epidemiology, Serodiagnosis, Antibodies, Humans, Cats, Bovines, Goats, Methylene blue, Meat, Indonesia, Reprints.
Identifiers: Toxoplasma gondi.

Sera from 1,050 persons, 69 cats, 18 goats, 23 bovines, 2 monkeys and 1 dog from 7 villages in South Kalimantan were tested for indirect hemagglutination Toxoplasma gondii antibodies. A seroepidemiologic study with the methylene blue dye test was conducted 1 year later at one village among 25 families and their cats. Toxoplasma antibody prevalence in man in different villages varied from 9.7% to 51.0%. Forty-one percent of the cats and 61% of the goats also had positive titers. None of the bovines was positive. The epidemiologic study indicated that, in spite of the presence of many infected cats in the village, goat meat was a significant source of Toxoplasma infection for man in this population. (Author)

AD-A027 616/2GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
A Chronic Implant for Intracerebral Mass Spectrometric Gasometry in the Rhesus Monkey.
James A. Kennealy, Ray D. Brown, Alva A. Karl, Francis W. Hogue, and Willi J. Buehring. 6 Jan 76, 5p Rept no. AMRL-TR-75-93
Availability: Pub. in Laboratory Animal Science, v26 n2 pt 1 p230-233 Apr 76.

Descriptors: *Surgical implantation, *Gas analysis, *Cerebrum, Brain, Mass spectrometry, Rhesus monkeys, Oxygen, Carbon dioxide, Partial pressure, Hypoxia, Laboratory tests, Reprints.

A cranial implant was developed to facilitate mass spectrometric gasometry in cerebral tissue of conscious primates. It is permanently fixed to the skull and allows repeated introduction of a Teflon diffusion membrane into the cerebrum. The implant is simple to manufacture and mount. It has been tolerated well with repeated introduction of the catheter for more than 6 mo in 10 rhesus monkeys. The preparation avoids the complication and artifacts of an acute surgical preparation for investigation of cerebral pO2 and pCO2 plus. (Author)

AD-A027 619/6GA PC$3.50/MF$3.00
California Univ San Francisco Dept of Neurology
Encephalopathy Following Treatment of Chronic Pulmonary Failure.
Final rept.,
Alan I. Faden. 13 Jun 75, 4p
Grant PHS-NS-05101-19
Availability: Pub. in Neurology, v26 n4 p337-339 Apr 76.

Descriptors: *Pulmonary function, Signs and symptoms, Hypercapnia, Hypotension, Hypoxia, Ischemia, Case studies, Treatment, Physiological effects, Long range(Time), Reprints.
Identifiers: *Encephalopathy, Alkalosis, Aminophylline.

An encephalopathy may occur following treatment of chronic pulmonary failure and is manifested by multifocal seizures, mild focal motor signs, and coma. The encephalopathy seems to be a multifactorial illness resulting from cerebral ischemica and hypoxia. The more important factors appear to be cerebral alkalosis, administration of aminophyline, and associated hypotension. (Author)

AD-A027 620/4GA PC$3.50/MF$3.00
Naval Medical Research Unit No 2 Apo San Francisco 96263
The Prevalence of Entamoeba Histolytica and Toxoplasma Gondii Antibodies in Central Java, Indonesia.
Technical rept.,
John H. Cross, George S. Irving, and S. Gunawan. 1975, 9p Rept no. NAMRU-2-TR-689
Availability: Pub. in Southeast Asian Jnl. of Tropical Medicine, Public Health, v6 n4 p467-471 Dec 75.

Descriptors: *Toxoplasma, *Entamoeba histolytica, Epidemiology, Antibodies, Serodiagnosis, Sex, Humans, Parasitic diseases, Indonesia, Reprints.
Identifiers: Toxoplasma gondi, Age distribution.

Sera collected from people living along the slopes of Mt. Merapi and Mt. Merbabu (900-1900 m) in Boyolali Regency, Central Java, Indonesia were tested by indirect hemagglutination tests for antibodies to Entamoeba histolytica and Toxoplasma gondii. A total of 895 sera from 439 males and 256 females, 2 to 75 years of age were tested for amoebiasis and 17.6% had positive antibody titers of 1:128 or greater. The prevalence of antibodies was the same for males and females and increased with age. The seropositivity rate for Toxoplasma gondii antibodies among 438 males and 255 females was 2% at titers of 1:256 or greater. The prevalence was higher in females (2.7%) than in males (1.6%), and was highest in the oldest age groups. (Author)

AD-A027 622/0GA PC$4.00/MF$3.00
Naval Medical Research Unit No 2 Apo San Francisco 96263
Diagnostic Methods in Other Tissue Helminthiasis Including Angiostrongyliasis, Gnathostomiasis and Trichinosis: A Review.
Technical rept.,
John H. Cross. 1974, 27p Rept no. NAMRU-2-TR-687
Availability: Pub. in Diagnostic Methods for Important Helminthiasis and Amoebiasis in Southeast Asia and the Far East (Japan), 5-8 Feb 74, p110-131 1974.

Descriptors: *Helminthic diseases, Parasitology, Nematoda, Trichinella, Diagnosis(Medicine), Reviews, Serodiagnosis, Reprints.
Identifiers: Angiostrongylus, Trichina, Gnathostoma.

The number of different helminth species capable of invading the tissues and organs of man is unknown but with the increasing awareness of parasitologists and physicians of infections of this kind new species are frequently being added to the list. Three important diseases caused by nematodes that invade tissue and which may provoke serious clinical manifestations and often death are angiostrongyliasis, gnathostomiasis and trichinosis. This paper reviews certain aspects of the diseases mentioned and present methods used to aid in their diagnosis.

AD-A027 623/8GA PC$3.50/MF$3.00
Naval Medical Research Unit No 2 Apo San Francisco 96263
Diagnostic Methods in Intestinal Fluke Infections: A Review.
Technical rept.,
John H. Cross. 1974, 25p Rept no. NAMRU-2-TR-686
Availability: Pub. in Diagnostic Methods for Important Helminthiasis and Ameobiasis in Southeast Asia and the Far East (Japan), 5-8 Feb 74, p87-106 1974.

Descriptors: *Intestinal parasites, Diagnosis(Medicine), Trematodes, Reviews, Parasitology, Serodiagnosis, Southeast Asia, Reprints.
Identifiers: Fasciolidae, Fasciolopsis buski, Heterophyidae, Echinostomatidae, Gastrodiscidae, Lecithodendriidae, Microphallidae, Plagiorchidae, Isoparorchiidae, Didymozoidae.

In this report emphasis will be placed upon the diagnosis of the more important intestinal flukes of Asia with additional information on some of the unusual, yet interesting, intestinal trematodes that have been reported from man. The various species will be presented according to family. (Author)

AD-A027 744/2GA PC$3.50/MF$3.00
Naval Medical Research Unit No 2 Apo San Francisco 96263
Febrile Illnesses Resulting in Hospital Admission: A Bacteriological and Serological Study in Jakarta, Indonesia.
Technical rept.,
Karl E. Anderson, Sam W. Joseph, Remy Nasution , 19 Jul 75, 11p Rept no. NAMRU-2-TR-693
Availability: Pub. in the American Jnl. of Tropical Medicine and Hygiene, v25 n1 p116-121 Jan 76.

Descriptors: *Febrile illness, *Hospitalizations, Salmonella enteritidis, Salmonella typhosa, Serology, Bacteriology, Epidemiology, Arboviruses, Malaria, Blood analysis, Indonesia, Reprints.

A study of 741 Inodensian patients with fever was carried out in order to determine what serious febrile illnesses are prevalent in Jakarta. All patients were hospitalized primarily because of fever and were studied by bacteriological and serological methods. Bacteremia due to Salmonella typhi (150 cases), S. enteritidis (36 cases), or both (2 cases) was common in both children and adults. Serological evidence of Salmonella infection was found in 130 additional cases without bacteremia. Serological evidence of arbovirus infection (94 cases) was common in children. Malaria was found in 12 adults, most of whom were probably infected outside Jakarta. Little serological evidence was found for rickettsial, leptospiral, Brucella, Toxoplasma gondii or a number of other infections. Clinical signs and symptoms in the febrile patients studied were generally nonspecific, and laboratory results reported were very helpful in establishing more accurate diagnoses.

HRP-0000496/0GA PC$6.00/MF$3.00
Ohio Valley Health Services Foundation, Inc., Athens.
Medical Adaptation of Microwave to Health Delivery: Medical Television in Southeast Ohio.
Final rept.,
Timothy P. Meyer. 4 Aug 70, 144p
See also HRP-0000549.

Descriptors: *Health care delivery, *Microwaves, *Information systems, Ohio, Telecommunication, Hospitals, Television systems, Recommendations, Health care requirements, Health manpower education, Medical education, Consulting services, Medical services, Medical personnel.

In 1969, the Ohio Valley Health Services Foundation in Athens and the Ohio Educational Television Network Commission in Columbus jointly agreed to participate in a medically oriented microwave television system study for southeast Ohio. The purpose of the study was to determine how television via a microwave system can be most effectively used to extend health services from Columbus to the seven county area of southeast Ohio. In addition, it was proposed that all health group needs that could be met by a television system be considered, and that a configuration upon which further growth could be predicated be provided.

HRP-0000503/3GA PC$8.00/MF$3.00
Public Health Service, Rockville, Md.
Alaska Native Medical Center and Anchorage Service Unit - Operating Plan - FY 1974.
1973, 246p

Descriptors: *Comprehensive health planning, *Health care delivery systems, *Alaska, *Health resources, Health planning, Projects, Health education, Community health services, Demography, Socioeconomic status, Medical services, Health care services, Social services, Health care requirements, Management, Health economics, Financial management, Budgeting.

The intent of the Operating Plan for FY 1974 is to manage the anticipated resources of the Alaska Native Medical Center as effectively and realistically as possible so that a basic, quality health program will result. The Anchorage Service Unit is described in terms of its hospital, geographical area served, population characteristics, communications, transportation, and sanitation facilities. Other socioeconomic factors are included to present the service unit in its entirety. Basic statistics are provided on workload and services, and medical and other professional services are briefly described. In addition, field health services, administrative and support services, training programs and special programs are outlined. Health problems, health related problems, and administrative - management problems are characterized as well as unmet needs for FY 1974 and the cost-out of the unmet needs. Emphasized plans include consultation and education for field station staff, improved walking blood bank, dental health education, and utilization of alternate health resources. Additional resource requirements are stipulated, and workload projections and a budget are provided in appendices. Portions of this document are not fully legible.

HRP-0000508/8GA PC$7.50/MF$3.00
Little (Arthur D.), Inc., San Francisco, Calif.
A Development Plan for Comprehensive Health Care in the Yukon-Kuskokwim Area. Volume I: Development Plan for Comprehensive Health Care.
Oct 72, 200p

Descriptors: *Comprehensive health planning, *Health care services, Objectives, Recommendations, Alaska, Health status, Quality assurance, Health resources, Tables(Data), Health care requirements, Quality of life.

The report, in both English and the native text, presents the issues and lays out the recommended mission goals, and objectives that are necessary for promotion of a healthy population, and the consequences of these goals and objectives for health resource requirements. The changing health status of the population of the Yukon - Kuskokwim area in Alaska is a major issue in the study. The mortality rate in this area has fallen, while incidence of communicable diseases has risen, as well as the incidence of accidents, and mental health problems. The community is moving from life threatening problems to chronic disabilities, and questions relating to the quality of life. Portions of this document are not fully legible.

HRP-0000509/0GA PC$5.00/MF$3.00
Wyoming Dept. of Health and Social Services, Cheyenne. Office of Comprehensive Health Planning.
Emergency Medical Services,
Larry Bertilson, and Ken Cole. 1972, 80p

Descriptors: *Wyoming, *Emergency medical services, Health manpower education, Health care facilities, Health care delivery systems, Ambulances, Rural areas, Urban areas, Population(Statistics), Ratios, Health care services, Health resources, Surveys, Evaluation, Recommendations, Tables(Data).

The Wyoming Division of Health and Medical Services has stated that the emergency facilities of the state must have a higher degree of capability for care of patients than comparable size hospitals in other metropolitan areas would be required to have, because of the sparse population and vast distances between medical care facilities in the State. The inability to increase financial capability within the emergency care systems in Wyoming leaves only training as the most feasible method upgrading the total emergency care system. In addition, better communications and emergency procedures within the total scope of emergency medical care should be stressed. A survey was taken of the 64 ambulance services operations in the state. These findings are presented in the form of charts and tables under several general headings encompassing ambulance service characteristics.

HRP-0000549/8GA PC$5.50/MF$3.00
Ohio Valley Health Services Foundation, Inc., Athens.
Medical Adaptation of Microwave to Health Delivery II: The Continuation Phase.
Interim rept.,
John E. Burke. Jan 71, 106p
See also HRP-0000496.

Descriptors: *Health care delivery, *Microwaves, *Information systems, Ohio, Telecommunication, Hospitals, Television systems, Feasibility, Health care requirements, Medical education, Consulting services, Medical services, Medical personnel.

The report represents the final product of a study to test the feasibility of certain applications of microwave for health delivery in southeastern Ohio, and is designed to describe the project activities and results, and to relate all significant information resulting from the project. It is written as an addendum to an earlier document, 'Medical Adaptation of Microwave to Health Delivery: Medical Television in Southeast Ohio.' The purpose of the initial study was to determine how television via a microwave system could be most effectively used to extend health services from Columbus to the seven county area of southeastern Oh. It also aimed to consider all health group needs that could be met by a television system, and to provide a configuration upon which further growth could be predicted.

HRP-0000611/4GA PC$9.00/MF$3.00
Northwest Georgia Regional Health Advisory Council, Inc., Cartersville.
Health Development Plan. Parts II and III. 1972.
Jack G. Whelchel. 1972, 260p

Descriptors: *Comprehensive health planning, *Health planning, *Health care delivery systems, Demography, Health statistics, Socioeconomic status, Public health, Environmental health, Health care services, Social services, Health resources, Health planning councils, Health

planning agencies, Project planning, Health care services, Health education, Health care requirements, Legislation, Georgia.

The Appalachian '202' legislation was designed to provide health demonstrations in particular areas for enhancing the economic development of the entire Appalachian region. The Northwest Georgia Regional Health Advisory Council was organized to represent certain counties in such a demonstration area. In Appalachian Georgia, the scarcity, maldistribution, and lack of coordination among the various health resources, all present problems in effective delivery of health services. The purpose of the Northwest Georgia Regional Health Advisory Council is to develop a system of delivering health care which will make health services available to all segments of the population. The geography of the region is described, as are population characteristics and trends. Health, socioeconomic and cultural information is provided. Sections are included on environmental factors, such as housing, transportation, sewer systems, and water supply, as well as on public health and related services. The Northwest Georgia Regional Health Advisory Council is described organizationally, along with its relationships to health planning, its program for a health delivery system, the projects involved, and its budget. Portions of this document are not fully legible.

HRP-0001595/8GA PC$5.00/MF$3.00
Michigan Dept. of Mental Health, Lansing.
Mental Health Programs: Characteristics and Performance.
May 73, 92p

Descriptors: Michigan, *Mental health care, Health care utilization, Health care services.

The major points of selected reports prepared on the activities of the constituent and affiliated agencies of the Michigan Department of Mental Health are summarized. Four criteria were used in selecting the subject matter: (1) size or scope of service delivery problem; (2) performance measures and levels achieved for various types of service delivery; (3) factors influencing the adequacy or understanding of performance; and (4) analyses relating to the delivery system as a whole, or to groups of agencies rather than to a particular agency. Individual chapters describe: size of State's mentally disadvantaged population; demographic characteristics of patients served by community agencies; age distribution of general population compared to State facility population; community programs, outpatient contacts, and terminations; performance measures; county admission and exit rates for State facilities; length of stay measures for State facilities; readmission, return rates, and length of stay in the community; and a cost profile for patients served at four facilities for the mentally ill.

HRP-0001814/7GA PC$11.00/MF$3.00
American Optometric Association, St. Louis, Mo. Committee on Public Health and Optometric Care.
Manual for Comprehensive Health Planning.
Jan 73, 425p

Descriptors: Universities, United States, Schools, Professional organizations, Private organizations, Private institutions, Nonprofit, Medical education, *Health resources, Health related organizations, Health occupations, Health manpower, Health manpower education, Health education, Health care requirements, *Comprehensive health planning, Allied health personnel.

A manual of background material relevant to legislation, structure, purpose, intent, and need of comprehensive health planning is provided, with the aim of furthering the efficient and productive participation of optometry at all levels of planning. Officials of the American Optometric Association at the national and State levels are listed, and schools and colleges of optometry are reviewed. The history of the Federal Government in health planning is summarized in an introduction to a discussion of the various government levels of comprehensive health planning. Optometric manpower at the present time and optometric needs as projected for States to 1980 are tabulated, optometric services are detailed, and the costs and plans for financing these services are discussed. The relationship between health planning agencies is examined, including councils of governments, economic development districts, Model Cities, the Office of Economic Opportunity health programs, and Regional Medical Programs.

HRP-0001847/7GA Not available NTIS
California Nurses' Association, San Francisco. Minority Group Task Force.
Minorities in Nursing.
Roy Campbell. Jan 73, 95p
Available from California Nurses' Association, 185 Post St., San Francisco, Calif. 94108, $3.00.

Descriptors: *Nurses, *Minority groups, *Health resources, Health occupations, Health manpower, California.

Goals and results are presented of a study conducted by means of surveys and interviews relating to the utilization of minorities in nursing in California. Specifically, the task force set out to determine: whether there is a discrepancy between salary levels of white and nonwhite nurses; whether most potential minority nurses are educated below the baccalaureate level; and whether minorities are represented in nursing schools, supervisory positions, and nursing associations to the same extent that they are represented in the general population. Surveys were distributed to minority nurses' associations, the California Nurses' Association, schools of nursing, and nursing personnel of various hospitals and agencies. Officers and staff members of the California Nurses' Association were interviewed directly. Based on data collected, the task force concluded that racism is institutionalized in the nursing profession, and that a salary differential exists between white and nonwhite nurses. Minority nurses are not proportionately represented in nursing schools or supervisory positions, and are educated at lower levels than their white counterparts. The report recommends that funding be sought for further studies and that nursing schools develop regulations relating to the inclusion of minority group members. Literature on discrimination is discussed, and an appendix provides samples of survey forms and interview questions used. A bibliography is also included.

HRP-0001854/9GA PC$4.50/MF$3.00
Public Health Service, Bethesda, Md. Div. of Nursing.
Interagency Conference on Nursing Statistics: Report of a Meeting.
May 72, 52p DHEW/NIH-72/276

Descriptors: Sources, *Nurses, Methodology, Health resources, Health occupations, Health manpower, Health care, Data, Data processing, Data collection, Data analysis, Data acquisition, Availability.

The proceedings of the November 1971 program meeting of the Interagency Conference on Nursing Statistics (ICONS), held to promote cooperation among statistical workers in various agencies concerned with nursing statistics, are summarized. The meeting was sponsored by the American Nurses' Association (ANA); representatives of the ANA, the National League for Nursing, the American Hospital Association, the American Medical Association, and several governmental agencies participated. The report contains the remarks made by program participants concerning their data collecting activities and interests, with specific reference to nurse manpower data. The following topics are discussed: a uniform evaluation protocol for midlevel health workers; manpower activities of the Division of Allied Health Manpower, National Bureau of Health Manpower Education, National Institutes of Health (NIH); institutional manpower data from Medicare; health manpower activities of the Bureau of Labor Statistics, Department of Labor; health manpower activities of the National Center for Health Statistics, Health Services and Mental Health Administration; health manpower activities of the Division of Manpower Intelligence, Bureau of Health Manpower Education, NIH; a planned nationwide survey of registered nurses employed in physicians' offices; data for an evaluation of the effectiveness and efficiency of nursing education programs; development of a nursing education information system; and occupational data from the 1970 census. Also included are brief outlines of the progress and plans for future projects of ICONS members.

HRP-0001903/4GA PC$7.75/MF$3.00
Massachusetts Office of Comprehensive Health Planning, Boston.
Comprehensive Health Plan for the Commonwealth of Massachusetts.
Mar 70, 206p

Descriptors: Systems, State government, Plans, Objectives, Methodology, *Massachusetts, Local government, Health planning, *Health care delivery, Health care delivery systems, Government policies, Development, Data acquisition.

This document is concerned with the proper allocation of health care resources (manpower, equipment, facilities, information, and funds) by both the Commonwealth of Massachusetts and the Federal government. Information is presented in a series of task force reports. The first deals with statewide comprehensive objectives; special statewide program, administration, and resource objectives; and regional objectives. A task force on health facilities reports on health care trends, issues, and problems. Health information systems are discussed in terms of purpose and relationship with ongoing and planned activities of various organizations. The goals of the task force on health services were to understand the health needs of the population, to have information on available health service resources, and to develop new patterns of service delivery. The manpower task force report details the growth in demand for health services and the difficulties encountered in obtaining these services, the supply and demand for specific health professions in Massachusetts, and the problems in meeting the manpower needs. Solutions include up-to-date information on distribution and needs, inventories of educational facilities and programs, restructuring of staff organizational patterns in health institutions, redefining job levels, and developing new professions to bridge the gaps in continuity of health care.

HRP-0001908/3GA PC$4.50/MF$3.00
Nebraska State Dept. of Health, Lincoln. Office of Comprehensive Health Planning.
Health System Developments for Isolated Rural Counties in Nebraska. A North Central Plains Project.
Calista C. Hughes, and John A. Sahs. 30 Sep 73, 52p
Contract HSM-110-72-298

Descriptors: Systems, State regions, Plans, Physicians, Objectives, *Nebraska, Methodology, *Health planning, Health occupations, Health care delivery, *Health care delivery

systems, Government policies, Documentation, Development, Data acquisition.

A 12-month effort is reported to plan health care delivery systems for selected rural communities in Nebraska. Placement of National Health Service Corps (NHSC) personnel in health care models developed to meet the special needs of this area is part of the overall plan. Particular problems arise from a combination of sparse population and poverty common to most rural areas, environmental hazards, and a low proportion of medical manpower to population. The project selected eight communities which had requested assistance in developing health plans; these were near or adjacent to counties lacking physicians, and had demonstrated a management capability for plan development and implementation. After a community was selected, the project office collected data applicable to the area and performed demographic and economic analyses and resource studies. Using this data, a basic management plan was developed for use in the subject community and other rural communities as appropriate. The characteristics of such a plan are summarized. Brief tables supplement the text. The desired rural system would have a single facility which would provide a full range of medical and health services, including prevention, rehabilitation, and emergency and home health care. Some remote rural communities would be served by commuting practitioners through formal agreements between practitioner groups and the community health center. The personnel requirements and estimated costs for the service unit are presented. Recommendations and guidelines are included in the report. Portions of this document are not fully legible.

HRP-0001976/3GA PC$5.00/MF$3.00
Idaho Governor's Advisory Council on Comprehensive Health Planning, Boise. Manpower Committee.
Health Manpower: Idaho's Plan for Action.
Oct 69, 88p

Descriptors: Recruiting, *Idaho, *Health resources, Health occupations, *Health manpower, Health manpower education, Health education, Health care requirements.

The status of health personnel in Idaho, health personnel needs, and a comprehensive plan for the training and recruitment of personnel are discussed. The health manpower problem is divided into four categories: (1) a static supply and an increasing demand for services; (2) inadequate training; (3) inadequate recruitment and retention practices; and (4) insufficient funding of educational programs. Recommendations for solutions are: (1) the State Board of Education should alleviate training and educational problems in nursing; (2) the State government and health professions should adopt a policy for out of State recruitment; (3) the State Board of Education should implement a program for coordinating continuing education activities for health manpower; (4) comprehensive health services to rural residents should be investigated; (5) funds must be appropriated by the legislature to initiate and expand programs; (6) the legislature must create a Health Manpower Commission in the executive branch; (7) funds must be appropriated for the establishment of a medical school; and (8) efforts must be made to inform high school students of career opportunities in the health fields. Appendix A provides an inventory of existing health manpower resources and health educational programs in Idaho and national health manpower trends and figures. Appendix B summarizes the job titles and descriptions of individuals providing health services. Appendix C is a brief discussion of the status of physicians' assistants in the U.S. and the Feldsher in the Soviet Union. Portions of this document are not fully legible.

HRP-0001973/7GA PC$11.00/MF$3.00
Texas State Dept. of Mental Health and Mental Retardation, Austin.
Texas State Plan for Construction of Community Mental Health Centers. Fiscal Years 1973 and 1974.
1974, 407p

Descriptors: *Texas, State government, Revisions, Plans, *Mental health care, Local government, Health care technology, Health care services, Health care facilities, *Health care delivery, Health care costs, Design, Construction.

The Texas State plan for construction of community mental health centers for the period 1973-1974 is presented. The plan delineates the State into 80 catchment areas, describes the existing pattern of services in those areas, and presents the priority system established for allocation of fiscal year 1973 and 1974 Federal construction funds. The goal is for maximum utilization of available funds for construction of facilities and provision of services designed to assure detection, treatment, and rehabilitation of the State's mentally ill population. Responsibility for general administration was vested in the Texas Department of Mental Health and Mental Retardation by legislation effective September 1, 1965. Administrative organization and functions are examined. Policies and assurances regarding construction and service delivery, as well as personnel selection, are detailed, followed by provisions for coordination and continuity of planning. The delineated catchment areas are identified and pertinent population and priority information data are included. An inventory of mental health facilities and services in each area is given, and current emphasis and projected plans in each area are summarized. Appendices provide an explanation for review of the State plan, information on staffing and construction grants, State grant in aid allocations, affidavit of publication notice, and provisions of the Mental Health and Mental Retardation Act.

HRP-0001981/0GA PC$6.00/MF$3.00
Oklahoma Univ. Medical Center, Oklahoma City. Health Resources Information Center.
Invitational Conference on Health Manpower Planning and Development.
Jun 71, 137p

Descriptors: United States, Strategy, Project planning, Objectives, Methodology, *Health planning, Health occupations, *Health manpower, Government policies.

Proceedings of a conference on health manpower planning and development held in Oklahoma City between June 20-25, 1971 are presented. The objective was to work toward improvements in health services in DHEW regions by fostering better planning for the development, deployment, and utilization of health manpower. Topics covered in the papers include: the educational implications of health manpower planning; manpower implications of innovations in health care organization and delivery; an economist's view of health manpower planning and development; use of systems analysis as a tool in manpower planning; perspectives and experiences in health manpower planning; and progress on a pilot project to develop a concept or model for a health inventory manpower system for the State of Louisiana. Other topics include: the components of a physician's associates program conducted by the University of Oklahoma to train baccalaureate level students; a rural medical care scheme adopted in New Mexico which uses a family nurse practitioner, or assistant, as a supplement to the physician; the use of carefully trained ex-medical corpsmen to aid rural Central Plains states' physicians in a MEDEX demonstration project; a progress summary of operation MEDIHC in Texas; the role of allied health schools in health manpower development; and a description of the health occupations training program of the University of Oklahoma Medical Center. Appendices list the conference advisory committee, Dallas regional office of DHEW, University of Oklahoma School of Health, and conference participants.

HRP-0002048/7GA PC$4.00/MF$3.00
Health Planning Council of the Jacksonville Area, Inc., Fla.
Nursing Personnel Utilization Study.
Dec 68, 33p
Grant PHS-41004-69

Descriptors: Specialists, Registered nurses, *Nurses, Licensed practical nurses, Health occupations, *Health manpower, *Health care utilization, Health care requirements, Florida.

Information gathered via a survey of staff nurses at 28 medical - surgical units of five hospitals in the Jacksonville, Florida area is presented. The questionnaire referred to three general categories of hospital personnel who perform patient service: registered nurses (RNs), licensed practical nurses (LPNs), and other paid and volunteer workers. Data were analyzed via computer and were graphed to illustrate who performs certain procedures in a nursing unit. Analysis of the 58 questions in the questionnaire indicates that nurses may be performing nonnursing procedures, with some of the procedures being shared by RNs and LPNs, while some are equally shared by all three categories of personnel. Housekeeping duties, however, are rarely performed by either RNs or LPNs. Within certain hospitals, personnel utilization is more consistent from unit to unit, if not more appropriate. Whether this practice is due to hospital nursing philosophy or hospital employment practices is not known. Northeast Florida, with its relatively high rate of hospital bed construction, is expected to experience an increased shortage in graduate nurses, as well as in allied health personnel, as construction progresses from planned to completed phases. It is therefore important that optimal use of nursing personnel be considered by all segments of medical and health care institutions employing the graduate nurse.

HRP-0002078/4GA PC$5.50/MF$3.00
Iowa State Univ., Ames. Industrial Relations Center.
Comprehensive Health Manpower Planning: Demonstration of Research - Conference Procedures for Estimating Health Manpower Requirements and in Evaluating Educational and Training Programs for Selected Health Occupations in Non-Metropolitan Areas.
Final Rept.
Edward B. Jakubauskas. 31 May 68, 102p
Grant OEG-1-7-078374-3897

Descriptors: Strategy, Methodology, *Iowa, *Health planning, *Health occupations, *Health manpower, Health manpower education, Health education, Health care requirements, Development, Data acquisition.

A project was undertaken to explore the feasibility of developing a comprehensive system for health manpower planning in Iowa that would involve educators, leaders in health occupations, State officials, and university research personnel. The initial phase of the pilot study consisted of developing a structure for estimating health manpower requirements through short-term and long-term procedures and in conducting and publishing studies on working conditions and attitudes of health personnel in selected occupations. Working papers for a Health Manpower Conference were prepared on national, State, and regional health manpower requirements and specifically on manpower requirements in Iowa for services in

clinical laboratory areas, dentistry and related areas, dietetic and nutrition areas, environmental health, medical records and library services, nurses and related personnel, rehabilitation, radiology, visual services and eye care, and pharmacy. Project findings underline the necessity for the continued establishment of additional health occupations education programs according to a need for supportive health workers; improvement of communications on all levels; improvement of the coordination of activities of major health and health related organizations in the State of Iowa; and establishment of a central information and education agency. Appendices provide information on resource personnel for the study and Conference participants, working papers, and reports. Charts detail the organization of the pilot study, suggested organization and flow for a health manpower data bank center, and a modal health planning and coordinating system.

HRP-0002082/6GA PC$3.50/MF$3.00
Colorado Health Careers Council, Denver.
Health Manpower Committee Report.
1971, 24p

Descriptors: Methodology, Health resources, Health occupations, *Health manpower, Health care, *Health care requirements, Data processing, Data processing systems, Data analysis, *Colorado.

The findings and recommendations of a study of Colorado health manpower by the Colorado Health Careers Council are presented. It was found that the data available from current sources of health manpower data vary and generally tend to be statistically unreliable and uncomparable; they are inadequate as a means of producing a representative picture of health manpower in Colorado. A short-term plan for analysis of current manpower problems assumes continuation of such activities as health presentations for schools and civic groups, centralized scholarship and loan source, health careers exhibits, career and training literature, objective counseling, and public relations emphasis. This plan also anticipates pursuit of a limited health manpower intelligence system and a project to define elements of comparability among existing and projected health manpower surveys in order to produce a continuing inventory and interpretation of Colorado health manpower intelligence without undertaking new surveys. The long-term plan emphasizes: continual updating and use of the health manpower definition in terms of Colorado's needs; consultation of health manpower data from other States; evaluation of current data and planning for effective use of future information; establishment of a comprehensive health manpower intelligence system that builds on the pilot efforts of the Colorado Health Careers Council; and better utilization of health personnel and training facilities.

HRP-0002091/7GA Not available NTIS
National Inst. of Mental Health, Rockville, Md.
Planning for Creative Change in Mental Health Services: A Manual on Research Utilization, for Researchers, for Consultants, for Administrators / Practitioners.
1971, 38p DHEW/HSM-73/9147
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $.45.

Descriptors: Technical assistance, Strategy, *Mental health care, Management, *Health planning, Health care services, Health care requirements, Agencies.

A guide is presented which is aimed at producing more effective mental health services through the utilization of knowledge and planned organizational change techniques. Individual chapters describe: the development of needed knowledge through research; resources, comprising suggestions on the role and functions of change agents; methods, describing techniques for promoting change; and adoption, relating to determinants and techniques of organizational change. Crucial to the production of utilizable research are a futures focus, identification and understanding of the user (practitioner), pilot projects, simulation of user conditions, use of advisory groups, selection of intervening variables and criterion measures in designing the proposal to be of concern to potential users, sensitivity to the host agency, target audience participation, regular reports and conferences, maintenance of communication, and participation of the investigator in diffusion and adoption. The change agent, or consultant, is the resource for bridging the gap between the producer of knowledge and the consumer; he must be effective in managing the various phases of planned change and in coping with resistance in the user organization. Methods to be considered in bringing about improvement or desired change are suggested including: personal contact, mediating journals, individual counseling, peer group discussion, temporary systems, Tavistock group therapy, legitimation and encouragement of challenge, Mann systematic use of feedback, and direct systematic alteration.

HRP-0002093/3GA Not available NTIS
National Inst. of Mental Health, Rockville, Md.
Continuing Education in Mental Health. Project Summaries.
Warren C. Lamson, Jeanette G. Chamberlain, and Richard J. Loebl. 1974, 210p DHEW/HSM-73/9126
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $2.80.

Descriptors: United States, Health occupations, Health manpower, *Health manpower education, Health education, Continuing education.

Summaries of each NIMH funded continuing education program in operation during 1972 to 1973 are provided. Every summary outlines general and specific educational objectives, methods and content of the program, significant characteristics of enrolled students, and program evaluation, including the potential for replication of the program, the impacts of the project to date, changes occurring in the program subsequent to submission of the most recent training grant application, the major strengths and weaknesses of the program, and analysis of its innovativeness as an approach to continuing education in mental health. Summaries are categorized according to the headings of continuing education for physicians, psychiatrists, behavioral scientists and allied professionals, nurses and related personnel, and interdisciplinary training. A total of 117 summaries are presented. The Appendix gives the overview of training program questionnaire mailed to the sponsoring organizations.

HRP-0002101/4GA PC$3.50/MF$3.00
Ernst and Ernst, Washington, D.C.
Methodology for Preparation of Capital Financing Elements of Personal Health Services Plans.
Martin A. Hadelman. 12 Oct 71, 17p

Descriptors: Reviewing, Projects, Methodology, Health care, Fixed costs, Evaluation, Comments, *Capital expenditures, Assessments.

This paper, presented at the annual meeting of the American Public Health Association in 1971, deals with the topic of preparing capital financing procedures for expansion of personal health care facilities. For the purposes of the paper, any personal health services plan is considered to be a capital expansion program, including hospital additions or modernization. General data requirements are listed in terms of sources of funding, plan objectives, staffing manpower needs, site plan with an area impact study, and alternative courses of action. Evaluation methods of applicants' finances and resources are examined as a means of determining project soundness. Categories of costs are also listed. Operating costs should be projected for each alternative plan and for existing facilities by estimating admissions, patient days, ancillary services, and general services. The areawide agency can assist the planner in relating the health needs information for an area by serving as a clearinghouse for all information, in bringing together interested parties, and by assisting in development of preliminary plans. Government planning agencies can assist with zoning approval of land use.

HRP-0002117/0GA PC$5.50/MF$3.00
Health and Hospital Planning Council of Southern New York, Inc., New York.
Physicians' Staff Appointments in Southern New York. October 1967.
Walter L. Johnson, Leonard S. Rosenfeld, and L. Carol Fernow. 1974, 123p
Grant PHS-CH-00388

Descriptors: Statistical distributions, State regions, *Physicians, New York, Health resources, Health occupations, *Health manpower, Health care, Distribution, Demography, Communities.

This report analyzes the distribution and characteristics of non-military physicians and their relationship to hospitals in a 14-county area of southern New York State. Data were collected on staff appointments according to type of institution and location, specialty status, medical schools, and year of graduation. Sources of information were American Medical Association files, records kept by the New York State Board of Regents, and hospital staff lists. A total to 32,620 physicians remained in the study group. The ratios of physicians to population were found to vary from 195 per 100,000 population in greater New York City to 53 per 100,000 population in isolated rural areas. The greater economic and professional opportunities of urban, high income areas are discussed with respect to their drawing power for physicians. The percentage of physicians in private practice with hospital appointments varied according to specialty and location; there was a tendency for the youngest and oldest age groups to be non-affiliated with hospitals. The study found an overall ratio of 39.9 hospital staff member appointments per 100 beds. The New York City area had a much higher ratio, and proprietary hospitals showed a higher ratio than voluntary and municipal hospitals. Selected characteristics and ratios of physicians are presented in the appendices.

HRP-0002119/8GA PC$4.00/MF$3.00
Vermont Univ., Burlington. Div. of Health Sciences.
Computer Modeling in Planning Graduate Medical Education.
Final Rept.
Ben R. Forsyth. 5 Mar 74, 49p
Contract N01-MI-24360

Descriptors: Vermont, System analysis, Methodology, Mathematical models, *Health manpower education, Health education, Health care, Data processing, Data processing systems, Data analysis, Curricula, Costs, Advanced programs.

This paper reviews some of the specific problems in managerial planning of medical schools, and discusses planning methods and techniques used by the University of Vermont College of Medicine in the analysis of those problems. A Program Cost Studies format was

used to assess the consequences of increasing educational activities coupled with decreasing research and research training in an institution with a defined and limited clinical base. The detailed analysis of the undergraduate medical education program was accomplished through two computer models, UGEDUC and TRANEE. UGEDUC analyzes the resource utilization of the basic science portion of the program, and TRANEE analyzes resource requirements of clinical training. Data were obtained through interviews with faculty and students. Results indicated that medical class size at the school could be increased by one-third within present limitations of resources by transferring faculty time to education from research. However, reducing research in the clinical sciences did not allow significant increases in educational effort. Program costs were also generated to indicate the range of costs possible with the larger class size. Tables and graphs provide input data and results. Portions of this document are not fully legible.

HRP-0002143/6GA PC$4.00/MF$3.00
Texas Hospital Association, San Antonio. Health Resources Planning Unit.
Demand Characteristics for Medical Care.
William S. Moore, and H. Barrett Bock. Feb 73, 40p
Grant PHS-HS-00314

Descriptors: Texas, System analysis, Methodology, Medical services, Measurement, Mathematical models, Health care, *Health care requirements, Forecasting, Data processing, Data processing systems, Data analysis.

The Health Services Simulator, developed by the Health Resources Planning Unit of the Texas Hospital Association, is a computer-based model which integrates various techniques and provides the capability to analyze and test the operation of health care delivery systems. This simulator is essentially a method for predicting the demand for medical care and a simulation model for measuring the requirements of medical care. Demand of a population is estimated by using multivariate regression equations which reflect demographic, economic, and social factors, and existing health resources of the population. The transitions of patients between levels of care, recovery, and death are processed by age group. The demand for medical care in the model is measured in terms of level or extent of care, duration, and disposition of cases. Patient linkage information allows descriptions of the effects upon all parts of the system due to changes in demand or characteristics of any part of the system. A comprehensive measurement of the demand for medical care generated by any given population group is attained by employing a subjective likelihood technique described as multiple estimate, collation with statistical data, and resolution. Dispositions from outpatient and inpatient care have been quantified, and the demand characteristics of medical care have been developed for specific age groups and conditions of health by the subjective likelihood technique.

HRP-0002159/2GA PC$4.00/MF$3.00
Health Manpower Council of California, Orinda.
California Health Manpower - 1970. Basic Occupational Information Series: Physical Therapists.
Daniel Hawthorne. Dec 70, 30p

Descriptors: United States, Statistical distributions, Health resources, Health occupations, *Health manpower, Health care, Distribution, Demography, Communities, *California, *Allied health personnel.

This report on physical therapists (PTs), which is one of an eight-part occupational series, presents and analyzes the basic data on this occupational category. Supply of physical therapists is presented and compared for both California and the United States as a whole. Nationally, both the number of PTs and their ratio to population rose slowly between 1965 and 1969. The PT to population ratio for the U.S. in 1969 was 7.2 to 100,000. Approximately two-thirds of the California PTs are women. The primary sources of California PTs are the schools of physical therapy. It was found that California has more PTs than any other State, with the distribution being varied throughout the State. It is stated that the changing pattern in delivery of physical therapy services presents serious handicaps in offering reliable information about the number of active physical therapists who will form part of California's health manpower supply. The number of PTs is expected to increase, with distribution expected to follow the present pattern, unless rapid increase of physical therapy assistants or training possibilities intercede. References and tables are included. Portions of this document are not fully legible.

HRP-0002806/2GA PC$5.50/MF$3.00
North Carolina Univ., Chapel Hill. Dept. of Hospital Administration.
Planning Data: A Survey of Nursing Homes and Chronic Care Facilities. Volume III.
W. Allen Smith. 1966, 114p
Grant PHS-AP-3201A

Descriptors: State regions, Patients, North Carolina, Methodology, Measurement, *Long term care, Inpatients, Health care, *Health care requirements, Acute care.

Findings of a study of nursing homes and chronic care facilities in the area under the jurisdiction of the Health Planning Council for Central North Carolina, are presented, with emphasis on their role in delivery of health care, their operation and utilization, and their ability to meet current demand. Information was acquired through personal interviews with administrators of the area nursing homes, using a questionnaire contained in the appendix as a guide. Types of ownership, types of homes, and types of care all were surveyed, and definition of terms is presented. An inventory is presented of: the facilities; staffing patterns; patient care; cost and charges; service area; age, sex and race of patients; types of accommodations; and utilization. Results of the survey indicate a need for additional nursing home beds, and that this need will grow in the future. Chronic care facilities studied were identified as a tuberculosis hospital, a rehabilitation hospital, and a mental hospital. A description is given of each facility, detailing services offered. Exploration of the teaching activities of the area chronic care facilities has developed an inquiry into their need for trained health workers. When questioned, respondents representing chronic care facilities, indicated that the actual need was in excess of some estimates given, but that budgetary limitations precluded their inclusion. The mental hospitals indicated the greatest need.

HRP-0002718/5GA Not available NTIS
Colorado Univ., Denver. Div. of Clinical Psychology.
Development of Views of Specialties During Four Years of Medical School.
Carl N. Zimet, and Mark L. Held. 1974, 10p
Grant PHS-RR-05357
Pub. in the Jnl. of Medical Education v50 p157-166 Feb 75.

Descriptors: Vocational guidance, Universities, Schools, *Medical education, Job analysis, Health resources, Health related organizations, Health occupations, Health manpower, Health manpower education, Health education, Colorado.

The development of specialty choice was investigated among 141 male medical students at the University of Colorado. Students indicated their specialty preference in their freshman, sophomore, and senior years; ranked each specialty by status; and completed a checklist in which they applied adjectives to themselves and to practitioners of each specialty. The greatest loss in specialty preference from freshman to senior year was in pediatrics and psychiatry. Increasing numbers of students chose internal medicine over the four years. Family practice and surgery changed little between the first and fourth years. Internal medicine experienced a steady rise in status rank over the four years. Surgery also ranked high in status; family practice and psychiatry ranked lowest. Surgery consistently ranked last in social attractiveness, while family practice ranked highest. Similarity to self -- i.e., lack of discrepancy between self description and description of practitioners of a specialty -- was low in the psychiatry group in the first year but progressed until, in the senior year, the congruence was greater in this group than in any other. Family practice, internal medicine, and pediatrics groups presented comparatively consistent similarity-to-self rankings. Surgery ranked last in this area; even those who had selected surgery as their specialty described themselves very differently from the way they described the typical surgeon. It is contended that students' beliefs about status, social attractiveness, and similarity to self strongly influence specialty decisions.

HRP-0002779/7GA Not available NTIS
Rutgers - The State Univ., Newark, N.J. School of Law.
Law and Poor People's Access to Health Care.
Norman L. Cantor. 1970, 11p
Pub. in Law and Contemporary Problems v35 p900-922 1970.

Descriptors: Sociology, Socioeconomic status, Socioeconomic factors, *Health care, Demography, Communities.

Potential legal channels to improve the low level of health care available to the poor are analyzed. The failure of Medicaid is cited as just one example of unfulfilled promises to the medically impoverished. It may be more expeditious to eliminate the underlying economic handicaps of the poor than litigation against institutions denying health care to the poor. Constitutional theories regarding economic discrimination, citing court cases, and the right to life are discussed, as are common law obligations regarding emergency care, and hospitals as public service institutions. Statutory provisions such as the Hill - Burton and Medicaid Acts are explored. It is concluded that the ultimate objective is adequate health care which is readily available for all citizens, and that the litigation has a role to play if the courts are to be innovative in shaping new rights for impoverished citizens. It is concluded that recent Supreme Court decisions do not furnish much basis for optimism. Reliance will have to be placed on the ability of both the Constitution and the common law to challenge social injustice in whatever limited ways legal remedies are suitable to solving massive economic and political problems.

HRP-0003078/7GA Not available NTIS
Michigan Univ., Ann Arbor.
Aspects of Medical Care Administration: Specifying Requirements for Health Care.
Avedis Donabedian. 1973, 663p
Available from Harvard Univ. Press, 79 Garden St., Cambridge, Mass. 02138, $27.50.

Descriptors: Standards, Reviewing, Quality assurance, Plans, Methodology, Measurement, Health occupations, Health care, Health care delivery, Evaluation, Criteria, Assessments.

A systemized view is presented of various aspects of medical care administration, with emphasis placed on the major tasks faced by the medical care administrator. The primary device of classification is supplemented with models intended to depict basic structural and functional relationships useful in the analysis of medical care phenomena. Individual chapters describe: the basic social values relevant to medical care administration and the distinctive characteristics of medical care; the objectives and inherent responsibilities of medical care organization; the assessment of need as a general concept and as health status or service requiring potential; the assessment of supply and the interrelationship between the capacity to produce, the services produced, and the need and demand for services; and methods for estimating requirements for services and resources. References accompany each chapter.

HRP-0003099/9GA Not available NTIS
Medical Coll. of Virginia, Richmond. Dept. of Hospital and Mental Health Administration.
Provisions of the National Health Planning and Resources Development Act.
Robin E. MacStravic. 1975, 4p
Pub. in Hospital Progress v56 p48-50, 80 Apr 75.

Descriptors: Systems, Plans, Objectives, Methodology, Legislation, Law(Jurisprudence), Health planning, Health care delivery, Health care delivery systems, Government policies, Development, Data acquisition.

The new health planning system created by P.L. 93-641, the National Health Planning and Resources Development Act of 1974, is described. The new system combines old programs and adds new ones. It reorganizes and combines comprehensive health planning, regional medical program, and Hill - Burton activities under the single rubric of health planning and development. It aims at rationalizing and improving the U.S. health system through specific agencies and programs which perform policy, planning, and program development activities. Details of the new program are outlined with respect to its policy, State planning, State resource development, local planning, local resource development, authorization levels, and regulation of existing programs. The new health planning legislation calls on hospitals and all providers to participate in the setting of policy at the national, State, and local levels, and it creates a health planning system that intends to get involved in all aspects of health care delivery.

HRP-0003122/9GA PC$4.50/MF$3.00
East Tennessee Health Planning Council, Inc., Knoxville.
Correlation of Rural Health Priorities with Urban Health Priorities in the Planning Process of the East Tennessee Health Planning Council, Inc. July 1, 1974 - April 30, 1975.
1975, 54p

Descriptors: Tennessee, Methodology, *Health planning, Evaluation, Documentation, Development, Data acquisition.

The purpose of this study is to determine to what degree urban and rural health priorities are encompassed in the health planning process of the author council. To do this, three topic areas are addressed: (1) establishment of urban and rural health priorities in terms of long-term facilities, emergency medical facilities, community-controlled facilities, need for physicians and dentists, and mental health; (2) the direction of the planning process; and (3) adjustments needed to direct planning to the goals. The results show a need for improvement of the planning process. Recommendations include greater flexibility toward both rural and urban priorities. Establishment of a system of rural input and participation in the process are also suggested. Follow-up of programs are also found lacking. The recommendations are presented as action-oriented measures that will facilitate solutions to the health problems of the East Tennessee area. Appendices provide lists of consultants and experts employed in the study, outlines of the study design, and a summary of the health planning process employed by the Health Planning Council.

HRP-0003146/8GA PC$5.00
Northwest Indiana Comprehensive Health Planning Council, Inc., Highland.
Comprehensive Health Plan.
Jan 73, 89p
Grant PHS-05-P-000-09-03

Descriptors: State regions, State government, Plans, Local government, Indiana, *Health care delivery, Environmental health.

A plan is presented for the future development of the health delivery system and improvement of environmental conditions in the seven county northwestern Indiana region. The counties include: Lake, Porter, LaPorte, Newton, Jasper, Starke, and Pulaski. The comprehensive health plan is discussed with regard to: consumer participation; health goals and priorities; the region and its people; health status and problems; hospitals, nursing homes, and home care agencies; ambulatory care and health services; health education and manpower; and mental health (alcoholism and drug abuse) and developmental disabilities, and other handicapping conditions. The scope and seriousness of environmental hazards throughout the region is documented, and the need for development of a sound implementation strategy for a comprehensive health plan is analyzed. Tables present statistical and summary data on health care in the region. Portions of this document are not fully legible.

HRP-0003185/6GA PC$5.00/MF$3.00
Minnesota Nurses Association, St. Paul.
Interstate Regional Planning for Rural Nursing. Final Report: Phase III.
Elizabeth F. Norod, Evelyn T. Peterson, and Lola I. Fredrickson. Jul 73, 98p
Contract PHS-72-4022

Descriptors: Wisconsin, Strategy, South Dakota, *Rural health services, Rural areas, Registered nurses, Regions(United States), Projects, Project planning, *Nurses, North Dakota, Montana, Minnesota, Michigan, Methodology, Licensed practical nurses, Iowa, Health resources, Health planning, Health occupations, Health manpower, Health care services, Health care requirements, Health care delivery.

A project carried out by the Minnesota Nurses' Association and sponsored by the Division of Nursing, Public Health Service, DHEW, to determine the feasibility of undertaking interstate regional planning for nursing needs and resources in the Ninth Federal Reserve District (Iowa, Michigan, Minnesota, Montana, North Dakota, South Dakota, and Wisconsin) is documented. The final report of the project includes the following: an outline of the history and organization of the project; details of the use of the Nominal Group Process, on a pilot study basis, for collection of information on nursing needs and resources with Minnesota and Wisconsin; and guidelines for continuation of efforts relative to regional planning and study of the problem of nursing in rural areas. Among the problems identified by the Nominal Group Process relative to nursing in rural areas were: shortage of staff, a constantly increasing and poorly planned workload, lack of communication among workers, limited inservice training and orientation, insufficient information about and time for patients, and weather and transportation. The feasibility of the Nominal Group Process as an exploratory research technique is discussed. Supporting documents are appended.

HRP-0003807/9GA PC$7.50/MF$3.00
Community Change, Inc., San Francisco, Calif.
Retrospective Study and Evaluation of Nursing Planning, A Feasibility Study.
Final Rept.
Kirke Wilson, Elaine Savitsky, and Elizabeth Wood. 14 Dec 73, 194p
Contract PHS-72-4266

Descriptors: United States, Reviewing, Research, Registered nurses, Objectives, Nurses, Methodology, *Health planning, Health occupations, Health care, *Health care delivery, Government policies, Feasibility studies, Evaluation, Comments, Assessments.

A preliminary study of nursing planning, designed to determine the feasibility of conducting an in-depth study of nursing planning, is presented, based on 97 studies (67 of which have been completed) between 1965 and 1972. Data were collected through review of publications of nursing studies, telephone interviews with key persons in completed studies, and visits to five representative study sites. Three primary influences on nursing planning -- conceptual (changing existing ideas about nursing), procedural (the actual planning process), and contextual (planning within the health environment) are discussed. The 97 studies of nursing planning are examined in terms of their sponsoring organizations, geographical scope, nursing discipline, education, organization, sources of funds, staffing, data collection methods, and implementation. Preliminary analysis of planning activity indicates that the type of sponsor of a planning activity influences the scope, purpose, structure, and results of a study; that planning structures and implementation are influenced by the purposes of the planning; and that planning methods are influenced by type of data collection and availability of data. Five case studies based on site visits are described. Conditions for the feasibility of an in-depth study are identified as: accessibility of key persons, adequate records, and accurate available data. Recommendations for an in-depth study and its content are suggested. Appendices include a list of planning studies, tables, a glossary, and site visit data. Portions of this document are not fully legible.

HRP-0004635/9GA PC$4.50/MF$3.00
Veterans Administration, Washington, D.C.
Basic List of Books and Journals for Veterans Administration Medical Libraries.
31 Jul 72, 41p
This is the 1971 revision of the August 15, 1967 edition.

Descriptors: Sources, Methodology, Health care, Documents, Availability. (U)

A basic list of books and journals for Veterans Administration Medical Libraries is contained in this bibliography prepared by the Central Office Library of the Veterans Administration. There are 378 books and 118 journal titles included in this edition, which is divided into four sections. Books are classified according to different disciplines within the medical field ranging from alcohol and drug dependence, and anatomy to tropical medicine, tumors and urology. Journals are classified according to specialty, and alphabetically. An author index is included. It is recommended that each medical library subscribe to one or more of the journals in each subject field in order that the various specialities may be assured representation. The index and abstract journals listed under 'Reference Aids' in the subject list are considered essential in order to provide wide coverage of the medical periodical literature.

Building of journal files in microform rather than bound journals is strongly recommended. Further recommendations are given for expanding the core collections to meet station needs, and the inclusion of audiovisual, nonprint items such as films, tapes, cassettes, or slides.

HRP-0004724/1GA PC$4.00/MF$3.00
Virginia Univ., Charlottesville. Div. of Health Services Research.
Evaluation and Design Activities in Health Manpower Planning.
Interim Rept. and Bi-monthly Rept. No. 2.
1 May 74, 37p
Contract NO1-MI-44057

Descriptors: Surrogation, Storage, Methodology, Information retrieval, Indexing, Health care, Documents.

A combined bi-monthly and interim report on a project relating to evaluation and design activities in health manpower planning is presented by the Division of Health Services Research of the University of Virginia Medical Center. A detailed program plan and task-time chart, and all coding and computer processing of survey instrument data have been completed, and information pertaining to the specific activities and problems in each region has been collected. An initial investigation of possible information sources for the long-term collection process has been started, and, using that information together with the initial results of the evaluation, the preliminary steps are being taken to develop a long-term system design. The survey instrument evaluation procedure is detailed, and mandatory and secondary sources of information (organizations and agencies that must be contacted) are described. Types of organizations to be contacted and the function of the individual interviewed within the organization are discussed, together with staffing, and presentation of organization charts. Activities and barriers are considered, as well as numbers of documents submitted. Activities to be completed during the remaining months of the project are outlined. Features of the preliminary system design are presented.

HRP-0005253/0GA Not available NTIS
Oklahoma Society of Internal Medicine, Oklahoma City.
Projecting the Estimated Needs for Internists in Oklahoma Through the Year 1990.
1975, 3p
Pub. in Oklahoma State Medical Association Jnl. v68 p308-310 Aug 75.

Descriptors: *Physicians, *Oklahoma, Methodology, Medical personnel, Health occupations, Health manpower, Health care, *Health care requirements, Forecasting.

The need for services of Internal Medicine specialists over the next 20-year period is estimated in this task force report of the Oklahoma Society of Internal Medicine. Data were obtained from pertinent medical literature, a survey of practicing internists in the State, and population projections obtained from the Research Department of the Oklahoma State Employment and Securities Commission. In 1970 there were 350 physicians identified as internists in the State. A questionnaire, with 240 responding, was distributed to these physicians questioning age, location, and type of practice. The data indicate that the State has one internist for every 7,312 persons, that 71 percent of the internists practice in urban areas which contain on 25 percent of the population, and that 42 percent are engaged in sub-specialty practice. To reach the optimal number of internists per population of one to 4000, with an estimated population increase in 1990 to 3,089,400, it would take another 107 internists to fill the gap created by the increased population.

HRP-0005287/8GA PC$3.50/MF$3.00
Comprehensive Health Planning Service, Rockville, Md.
Areawide Health Planning Agency Performance Standards.
Oct 73, 23p

Descriptors: Methodology, Management, Health resources, Health related organizations, Health planning, Evaluation, *Comprehensive health planning, Agencies.

Agency performance standards for Section 314(b) comprehensive areawide health planning agencies, developed by the Comprehensive Health Planning Service, Bureau of Health Resources Development, U.S. Dept. of Health, Education, and Welfare, are presented. The standards are intended to define the role and responsibilities of these agencies in the following functional areas: health plan development and implementation, studies, public issue involvement, project review, agency management, community participation and education, planning coordination, and data management. Each function is described and broken down into elements which identify the specific components necessary to perform the function satisfactorily. The standards were developed with consultation from both staff and council members of State and areawide health planning agencies, and were influenced by the development of a resource allocation model in DHEW Region IX, by the final report of the Expectations Study, and by the development of the agency assessment process and training. The standards will be used as criteria in the agency assessment process.

HRP-0005310/8GA PC$4.00/MF$3.00
Comprehensive Health Planning Service, Rockville, Md.
State Health Planning Agency Performance Standards.
Nov 73, 28p

Descriptors: Methodology, Management, Health planning, Evaluation, Agencies.

Performance standards developed by the Comprehensive Planning Service to define the roles and responsibilities of State Health Planning Agencies (SHPA) are presented. These responsibilities are categorized in nine areas: health plan development and implementation, studies, health policy involvement, project review, program management, public information and education, planning coordination, areawide development and assistance, and data base management. Each agency function is described and arranged into elements which identify specific components necessary to perform the function. These performance standards will be used in evaluations to assess the effectiveness of State agencies.

HRP-0005440/3GA Not available NTIS
National Center for Health Statistics, Rockville, Md.
Design and Methodology for a National Survey of Nursing Homes.
Earl Bryant. Sep 68, 43p
This document is number seven in Vital and Health Statistics series number one (Programs and Collection Procedure).
Available from the Scientific and Technical Information Branch, National Center for Health Statistics, Room 8-20, 5600 Fishers Lane, Rockville, Md. 20852, one copy free.

Descriptors: United States, Surveys, Sampling, Patients, Nursing, Methodology, Long term care, Inpatients, Health resources, Health care, Health care facilities, Design, Data collection, Data acquisition.

The sample design and survey procedure used in 1964 by the National Center for Health Statistics (NCHS) for obtaining statistics about nursing homes in the United States, their patients, and their employees is described. The report also provides information on the magnitude of certain types of measurement errors, including errors in selecting the sample of employees, and of nonresponse. The sample design was a stratified, two-stage probability design. The first stage was a systematic sample of homes from a list frame (the Master Facility Inventory) within each of 12 bed-size, type-of-service strata. A sample of patients and a sample of employees were selected from each of the sample nursing homes. The second stage sample was selected by an interviewer at the time of a visit to the home according to instructions provided by NCHS. The report describes training procedures for field supervisors and interviewers and procedures used in obtaining establishment cooperation. A sequential account of how the survey was conducted in a home is provided. It is noted that the survey was complex, in that information was collected about three different sampling units (homes, patients, and employees), and a number of different respondents and data sources were used. Appendices present estimation and sampling variance equations, definitions of terms used in the survey, a classification of homes by type of service, and copies of all forms and questionnaires used in the survey. A bibliography is included.

HRP-0005586/3GA Not available NTIS
Saint Vincent's Hospital and Medical Center, New York.
Emergency Cardiac Care Outside the Hospital - A Symposium.
William J. Grace. 1974, 53p
Pub. in Heart and Lung: Jnl. of Critical Care v3 n5 p733-784 Sep-Oct 74.

Descriptors: Medical equipment, Health care technology, Health care services, *Emergency medical services.

Various systems for delivering out-of-hospital emergency coronary care are examined in this series of ten papers concerning the immediate treatment of cardiac arrest using the techniques of the hospital-based coronary care units (CCU) which provide trained personnel, constant electrocardiogram (ECG) monitoring and instant attention to life - threatening arrthymias. The papers, by different authors, present information on the importance of treatment during the first hour in acute myocardial infarction; the reduction of pre-hospital, ambulance, and hospital coronary death by the pre-hospital emergency cardiac care system; experiences with a nurse-staffed ambulance; the experimental Oregon coronary ambulance project; and the use of telemetry in relaying the electrocardiogram to a base hospital. Other papers discuss experiences with a private ambulance service, an eight-year experience with a stadium-based mobile coronary-care unit, emergency cardiac care in a metropolitan office building, and life-support units. The equipment and drugs needed for mobile care units are discussed, and training of emergency care personnel, the importance of good communications systems and constant ECG monitoring are stressed in one or more of the papers. Graphs and diagrams present supportive data and references for each paper are provided.

HRP-0005636/2GA Not available NTIS
Close-up of Physicians' Assistants.
Marcia Opp. 1975, 9p
Pub. in Medical World News p55-58, 60, 62, 64-66 May 75.

Descriptors: United States, Physician extenders, *Physician assistants, Legislation, Law(Jurisprudence), *Health resources, Health

occupations, Health manpower, Health care delivery systems, Employment.

The role of the physicians' assistant (PA) and what duties he can perform are explored in an attempt to determine exactly how much supervision a PA must have. Legal challenges confront questions of third-party reimbursement for PA services and the specified definition of services. Physicians have used and hired physicians' assistants in the face of potential legal entanglements in order to expand their practices, to be able to get away from the practice from time to time, and to upgrade the quality of medical care. Examples of how PAs can help physicians to achieve these objectives are cited. Experts urge further training and greater use of PAs, not only in primary care but also in such specialties as urology, anesthesiology, radiology, and obstetrics and gynecology. A study at the University of Colorado indicated that the use of a PA increased patient volume by an average of 40 percent. However, it was noted that physicians do not always use PAs optimally. The insurance industry has made malpractice insurance available to PAs, and States have varying rules and regulations concerning physician supervision of PAs and their examinations and licensing. A chart details legal ground rules for PAs in 37 States.

HRP-0005652/3GA Not available NTIS
American Hospital Association, Chicago, Ill.
Emergency Services. The Hospital Emergency Department in an Emergency Care System.
1972, 103p
Available from the American Hospital Association, Dept. of Order Processing, 840 North Lake Shore Dr., Chicago, Ill, 60611, $3.50.

Descriptors: Strategy, Standards, Reviewing, Quality assurance, Project planning, Methodology, Measurement, *Health planning, Health care, Health care services, Health care delivery, Evaluation, *Emergency medical services, Criteria, Assessments.

General principles for appraising and planning the various elements of a hospital emergency department and for establishing suitable policies and procedures are presented by the American Hospital Association. Regional planning goals and objectives and their implementation are considered, as is the problem of increased use of emergency departments for nonemergency uses. Communitywide planning for emergency services is discussed. Steps involved in developing a hospital emergency department are delineated, including: staffing, services, clinical procedures, clinical reference material, medical and administrative records, review and quality control of medical care, disaster preparedness, community relations, legal aspects, and physical aspects and requirements of a hospital emergency medical department. Other issues considered are: utilization patterns, triage, arrangement for primary care, categorization of facilities, development and training of health personnel, communications, transportation, public education, and interacting programs. Selected reference materials are provided, and supplementary data are included.

HRP-0005656/4GA PC$3.50
West Central Florida Comprehensive Health Planning Council, Inc., Sarasota.
Sarasota Nursing Home Facilities Study.
Mar 74, 24p
Grant PHS-04-P-000-024-03

Descriptors: State regions, State government, Plans, Patients, Nursing, Long term care, Local government, Inpatients, *Health resources, Health care requirements, *Health care facilities, Health care delivery, Florida.

Findings of a 1974 survey of the 11 nursing homes and one retirement center with a nursing care unit in Sarasota County, Florida, are reported by the West Central Florida Comprehensive Health Planning Council. The report includes a list of the facilities surveyed; summaries of patient characteristics, finances, occupancy, services offered, and future plans; an estimation of nursing home bed need; and recommendations. Sarasota County, at the time of the survey, had 1,083 nursing home beds, with an additional 133 beds approved for construction. Noting the lack of a standardized method for calculating bed need, the Council bases its estimate on a percentage of 3.5 percent of the population aged 65 and older. Current additional bed need is calculated to be 336. In its recommendations, the Council notes that application for intermediate care beds should be given priority. Day care centers and other community care alternatives for the aged, as well as tri-level care living facilities for the aged, are encouraged. The State government is urged to review the discrepancies in reimbursements for skilled and intermediate care beds and the lack of specific reimbursement for those housed in institutional homes for the aged. Appended materials include the portion of the State medical facility plan pertaining to Sarasota, supporting statistical data, and a copy of the questionnaire used in the nursing home survey. Portions of this document are not fully legible.

HRP-0005667/1GA Not available NTIS
Yale Univ., New Haven, Conn.
Modeling the Movement of Coronary Patients within a Hospital by Semi-Markov Processes.
Edward Kao. 7 May 73, 9p
Pub. in Operations Research p683-699 Jul 74.

Descriptors: System analysis, State regions, Patients, Methodology, Mathematical models, Inpatients, Health care, Health care utilization, Health care facilities, Data processing, Data processing systems, Data analysis, Connecticut, Acute care.

A semi-Markovian model is used to describe the movement of coronary patients within a hospital and to show that length-of-stay distribution in each care unit varies with the destination unit to which the patient is transferred. The Markovian chain is applied to a study of 555 patients admitted to the coronary care unit (CCU) of the Hospital of St. Raphael in New Haven, Connecticut between May 1, 1966 and April 30, 1968. The transition probabilities of two patient paths beginning with the CCU and the post coronary care unit are estimated. The analysis reveals that the length of stay in each care unit depends not only on the diagnosis, but also on the next care unit to which the patient will be transferred. A method for estimating patient-day and length-of-stay statistics based on the model is developed for individual units and for the hospital. An approach for reconstructing original arrival distribution based on admission data is presented. Supporting data and mathematical formulations are included.

HRP-0005687/9GA PC$3.50/MF$3.00
American Coll. of Surgeons, Chicago, Ill.
Model Ordinance Regulating Ambulance Service.
Aug 66, 24p

Descriptors: Legislation, Law(Jurisprudence), Health care services, Health care delivery systems, *Emergency medical services.

A model ordinance for regulating ambulance service, developed in a Joint Action Program of the American College of Surgeons, American Association for the Surgery of Trauma, and the National Safety Council, is presented as reissued in Agust 1966. The model is intended to serve as a guide to improving ambulance services and to promoting uniformity of these services throughout the United States. It is noted that the model is designed so that, with appropriate changes, it may be used as a statute. Where feasible, it is suggested, a State statute is preferable to a local ordinance. Included in the model are sections on the following: definitions; license required; application for ambulance license; standards for ambulance license; standards for ambulance license-liability insurance; duties of license officer; and duties of health officer. Sections also discuss: standards for ambulance equipment; applications for drivers, attendants, and attendant-drivers license; standards for drivers, attendants, and attendant-drivers license; renewal of license; revocation of license; reports; obedience to traffic laws, ordinances, and regulations; penalties; separability; effective date; and ordinances repealed.

HRP-0005720/8GA PC$3.50/MF$3.00
Arkansas Health Systems Foundation, Little Rock.
Health Management Information System.
1973, 17p

Descriptors: Sharing, Services, Organization theory, Methodology, Maintenance, Information systems, Health resources, Health related organizations, *Health care, Health care services, Development, Data, Data processing, Data processing systems, Data bases, Biomedical information systems, Arkansas.

The approach proposed by the Arkansas Health Systems Foundation for the design, development, and implementation of a Health Management Information System (HMIS) to meet the needs of three health centers is outlined. It is the Foundation's belief that the standard HMIS format allows sufficient flexibility to capture the uniqueness of a specific health center while providing sufficient standardization to insure the validity and reliability of variable comparisons. The primary function of the HMIS is to provide useful information to the managers of the health centers. Health management is defined, and three basic elements are noted: planning, analysis, and control. Design criteria for the HMIS are that it provide accurate, timely, useful data for management planning, analysis, and control of the health center. The System is seen as a combination of data collecting devices, e.g., encounter forms that collect data at provider sites; channels for processing and feedback of the data; analysis of the data by comparing with planned goals and objectives; and the resulting decisions. An approach to HMIS development is outlined which involves indexing each center by preventive, acute, chronic, and emergency services and then relating its respective manpower utilization on an individual basis. A sequence of tasks to be performed for HMIS development, an estimated time sequence, and a list of personnel involved in each task are included.

HRP-0005723/2GA PC$4.00/MF$3.00
Arkansas Health Systems Foundation, Little Rock.
Consumer Information and Education Handbook for the Emergency Medical Services System.
1973, 37p
Contract HSM-110-72-343

Descriptors: Strategy, Project planning, Plans, Methodology, *Health planning, Health education, Health care delivery, *Emergency medical services, Development, Data acquisition, Arkansas.

Suggestions for planning for a consumer information and education program relating to Emergency Medical Services (EMS) systems are presented in this handbook prepared by the

Arkansas Health Systems Foundation staff. The objectives of such programs are to increase public awareness and involvement in activities of the EMS, with special emphasis on education of the public in the handling and reporting of emergencies. It is important to divide the community into audience groups (school children according to age and / or grade level, professional groups, civic groups, women's business and social groups, and to determine the type and amount of information to be presented. Methods of enlisting aid from the media are presented, together with detailed instructions on how to write a news release. Press conference procedures are discussed, and a sample fact sheet to be distributed to those attending is included. For rural areas it is extremely important to conduct outreach programs, and two pilot programs that can be successfully replicated are described. The outreach program, which is a proven technique for information dissemination in highly rural areas, is especially appropriate for districts experiencing delay in implementing centralized dispatch. Methodology, field reports, and sample fact sheets for the outreach program are provided.

HRP-0005751/3GA PC$4.00/MF$3.00
Michigan Dept. of Public Health, Lansing. Bureau of Health Facilities.
Cardiac Care Units. Minimal Criteria and Guidelines. Revised.
Dec 72, 31p

Descriptors: Standards, Reviewing, Quality assurance, Projects, Michigan, Methodology, Measurement, Health care, Health care delivery, Evaluation, Criteria, Comments, Assessments.

Revised criteria and guidelines for cardiac care units in hospitals are presented by the Michigan Department of Public Health, with updating resulting from changes in concepts. Certain deletions were made, and items required as of December 1972 be adopted through the required legislative procedures for incorporation into the State Administrative Code. The purpose and definition of a cardiac care unit is given, together with general considerations. Planning considerations include methods, administration of the unit, and admission criteria. The physical design of the unit is specified regarding location, size, space, physical design and structural needs. Essential equipment should include: monitoring equipment, resuscitative equipment, supportive equipment, and additional supportive equipment. Personnel requirements are stated for the director, staff physicians, the educational program for physicians, nursing staff, and other ancillary services such as dietitians, social workers and pharmacists. Other concerns are noted, including: visiting, behavioral problems, communicable diseases, gift-giving to patients, and information access and accumulation. Specifications also are given for safe designing of the cardiac care unit, safety practices therein, and a preventive maintenance program. Appendices present data on safety precautions and equipment testing; suggested cardiac care facilities in and by annual caseload; and optional community educational services. A reference list is provided.

HRP-0005762/0GA PC$4.00/MF$3.00
Michigan Dept. of Public Health, Lansing. Bureau of Health Facilities.
Tuberculosis Services in General Hospitals. Minimal Criteria and Guidelines.
Feb 71, 29p

Descriptors: Standards, Reviewing, Quality assurance, Michigan, Methodology, Measurement, Health care, Health care delivery, Evaluation, Criteria, Assessments.

Criteria and guidelines are offered by the Michigan Department of Public Health as an aid for evaluation of hospitals presently offering tuberculosis care, and to assist those who may be planning to develop a tuberculosis program. These guidelines are medically, epidemiologically and sociologically sound, reasonable, and attainable by any well organized hospital of sufficient size to justify undertaking a tuberculosis care program. With the advent of antibiotic and chemotherapy treatment, tuberculosis treatment concepts have radically changed, and many specialized tuberculosis facilities have been closed or converted to other usage. Increased reliance has been placed on the general hospital for tuberculosis cases that do occur. Planning and physical design considerations of the segregated units for tuberculosis care are presented, as well as necessary equipment, and personnel. The latter includes medical director and staff, consulting services, nursing and dietary services, housekeeping, medical records, social services, diversional and recreational services for patients, and employee health supervision. Also to be considered are environmental protective and decontamination measures, and post-hospital care. Visiting, gifts, and behavioral problems are also discussed. Appendices provide references and a digest of the public law concerning tuberculosis care and treatment.

HRP-0005763/8GA PC$4.50/MF$3.00
Michigan Dept. of Public Health, Lansing. Bureau of Health Facilities.
Hospital Nurseries and Newborn Infant Care Services: Minimal Criteria and Guidelines.
Nov 72, 58p

Descriptors: Strategy, Standards, Reviewing, Quality assurance, Project planning, Patients, Michigan, Methodology, Measurement, Inpatients, *Health planning, Health care, *Health care services, Health care delivery, Evaluation, Criteria, Assessments, Acute care.

Minimal criteria and guidelines are offered for the planning, organization, and conduct of hospital newborn infant care services. Since it is not economically feasible for all hospitals operating newborn services to serve all of the needs of high - risk newborn infants, a regional planning approach is essential. General considerations in planning for newborn care include the different levels of care, availability of professional personnel, neonatal intensive care unit, and optimum care requirements. Considerations of physical design, furnishings and equipment, personnel, and patient care are discussed. Detailed information is provided on planning and operating neonatal intensive care units. In planning for neonatal intensive care services, projections must be made of potential patients and of manpower requirements, and protective techniques, supportive diagnostic services, inhalation therapy, and bed capacity must be considered. The physical design of the neonatal intensive care unit must make provision for various levels of care, for necessary furnishing and equipment, elimination of potential electrical hazards, and for the establishment of a speedy, effective infant transport system. Appendices present supplemental data.

HRP-0005764/9GA PC$4.50/MF$3.00
Michigan Dept. of Public Health, Lansing. Bureau of Health Facilities.
Kidney Transplantation Services. Minimal Criteria and Guidelines.
Mar 72, 45p

Descriptors: Standards, Reviewing, Quality assurance, Michigan, Methodology, Measurement, Health care, Health care delivery, Evaluation, Criteria, Assessments.

Minimal criteria and guidelines are offered by the Michigan Department of Public Health in order to assure careful and competent planning for a high quality of service for kidney transplantation procedures. Nineteen basic considerations are listed which should be borne in mind by any hospital considering the establishment of a transplantation program. Definitions are provided and the stages and considerations necessary in planning are outlined. The physical design of the facility is discussed including patient rooms and operating room, and necessary equipment including hemodialysis support, resected kidney preservation equipment, mechanical perfusion equipment, and other ancillary equipment, is described. Personnel for transplantation services, medical and nursing, are considered. Other areas of concern which are discussed are: informed written consents from both recipient and living donors, as well as legal proof of consent from deceased donors; protective isolation of transplanted patient; education; and records and statistical data. The importance of donor kidney availability is stressed in Appendix One, and regulations, forms, and documents relating to kidney donors are contained in the remaining appendices.

HRP-0005765/3GA PC4.00/MF$3.00
Michigan Dept. of Public Health, Lansing. Bureau of Health Facilities.
Rehabilitation Units. Minimal Criteria and Guidelines.
Jun 73, 36p

Descriptors: Standards, Reviewing, Quality assurance, Michigan, Methodology, Measurement, Health care, Health care delivery, Evaluation, Criteria, Assessments.

Criteria and guidelines in the field of physical rehabilitation are presented by the Michigan Department of Public Health to stimulate attention to rehabilitation as a phase of medicine of great importance; to help in finding and directing individuals who might benefit from rehabilitation care into appropriate hands; and to provide a common minimal level of facility resources in the community. General considerations, objectives, policies, and scopes of services offered are discussed. Definitions are provided for: rehabilitation and rehabilitative services; physical medicine and physical therapy; the physical therapist; rehabilitation nurse; occupational therapy and therapist; psychologist; vocational rehabilitation; audiologist; and speech and language pathologist; prothetist and orthotist; social workers; and vocational rehabilitation counselors. Organizational types of administration are discussed, as are departmental facilities and staff, and operational methodology is considered. References are furnished.

HRP-0005767/9GA PC$4.50/MF$3.00
Michigan Dept. of Public Health, Lansing. Bureau of Health Facilities.
Pediatric Services in General Hospitals. Minimal Criteria and Guidelines.
Mar 71, 64p

Descriptors: Standards, Reviewing, Quality assurance, Projects, Michigan, Methodology, Measurement, Health care, Health care delivery, Evaluation, Criteria, Comments, Assessments.

Minimal criteria and guidelines for pediatric services in hospitals, as presented by the Michigan Department of Public Health, are intended to assist in the operation of hospitals or the development and operation of pediatric services. Proposed minimal requirements for acceptable services are printed in bold face type. It is generally agreed that a community hospital of 100 to 150 beds should have a minimum of 12 to 15 pediatric beds. General considerations, definitions and objectives are outlined and steps in planning are given. The physical design of acute pediatric units is discussed, including location in the hospital, components, space,

physical design, and structural needs. Furnishings and equipment needs are detailed, and outpatient and emergency services to be offered are described. Qualifications of personnel are presented, including the director or head of the pediatric service, staff physicians, nursing, and ancillary services (dietitian, social worker, therapists, etc.). Aspects of general and special care are discussed, including areas of special concern such as: communicable and infectious diseases; intensive, cardiac, hemodialysis, burn care; long-term illness; psychiatric care; inhalation therapy; pharmacy; clinical laboratory and pathology; and radiology. Isolation techniques are presented in the appendix and references are furnished.

HRP-0005776/9GA PC$3.50/MF$3.00
Michigan Dept. of Public Health, Lansing. Bureau of Health Facilities.
Guidelines for Hospital Obstetrical Departments and Newborn Nurseries. Revised Edition.
1968, 14p

Descriptors: Standards, Revisions, Reviewing, Quality assurance, Michigan, Methodology, Measurement, Health care, Health care technology, Health care facilities, Health care delivery, Evaluation, Design, Criteria, Assessments.

Guidelines for hospital obstetrical departments and newborn nurseries are presented by the Michigan Department of Public Health in order to insure mothers and their infants a continuum of high quality services delivered in an acceptable, efficient, and economical manner. The location and accessibility of such services in a general hospital are outlined, with standards given for caseload and utilization. Provision of at least one room, an outside room with a window, should be made for the labor room or suite (depending on caseload). Standards for the delivery room if caseloads require more than one are given, and specifications are outlined for the postpartum suite. An obstetrical recovery room may be located adjacent to the delivery suite or in the postpartum suite. Specifications for newborn nurseries are given and provision is made for the isolation of an infant and / or mother. Nursing staff requirements are provided. Standards are described for the physician staff, the anesthesia services, and for utilization of related services in the hospital. Inservice education and training for obstetrical nurses is stressed, and a table presents data on suggested facilities by annual caseload.

HRP-0005778/9GA PC$3.50/MF$3.00
Greater Detroit Area Hospital Council, Inc., Mich.
Procedures for Reviewing Hospital Construction Proposals in Southeastern Michigan.
27 Jun 73, 21p

Descriptors: State regions, Reviewing, Projects, Michigan, Methodology, Instructions, Health care, Health care requirements, *Health care facilities, Evaluation, Comments, Certification, Assessments.

Five steps in the procedure to review hospital construction proposals are presented by the Greater Detroit Area Hospital Council and Comprehensive Health Planning Council (CHPC) of Southeastern Michigan. The review by the Hospital Council and CHPC is to obtain advice on whether a Certificate of Need application should be filed. The procedure specifies: (1) that there should be continuous interaction between the Hospital Council's planning staff and representatives of each hospital or community group actively engaged in planning; (2) that any hospital may request a periodic review of its planning by the Hospital Council's planning committee at any time to obtain objective advice and a general sense of direction; (3) at least six months prior to the expected date of application for a Certificate of Need, the Hospital Council and CHPC will, on request, carry out a program planning review; (4) at least three months prior to the expected application date for Certificate of Need, a simplified review of the specific construction proposal be furnished; and (5) after formal application for a Certificate of Need is filed with the State agency the Hospital Council and CHPC will make a pro forma review of the proposal and transmit its recommendations to the State agency. Detailed information is provided for each step in the review process.

HRP-0005781/9GA PC$3.50/MF$3.00
American Public Health Association, San Francisco, Calif.
Statement on the Principles of Comprehensive Health Planning.
1967, 7p

Descriptors: Private organizations, Private institutions, Objectives, Nonprofit, Methodology, Health resources, Health related organizations, *Health planning, Government policies.

A four-page policy statement on the principles of comprehensive health planning is presented by the Governing Council of the American Public Health Association (APHA). The statement reflects concern over the confusion and competition that is emerging in the area of health planning on the one hand, and the unwarranted expectation placed on planning to solve all problems of the health industry on the other. Comprehensive health planning is described as an effort to balance total health resources against total health needs to provide appropriate guidance to other public efforts with health implications. The statement defines and distinguishes among three types of planning activities: agency administrative or program planning, interagency categorical planning, and comprehensive planning. In support of health planning in all its aspects, the APHA offers eight principles to assist communities and agencies in the planning process. The imprecision of definition of the term 'comprehensive health services' is noted, and the necessity for interpreting comprehensive health services, in planning for personal and environmental health services, within the context of the specific program under consideration is observed. The statement closes with a commitment by APHA to the goal of comprehensive health service.

HRP-0005798/4GA PC$6.00/MF$3.00
Texas Coll. and Univ. System, Austin. Coordinating Board.
Multiple Entry and Exit Curriculum Model in Nursing.
Final Rept.
Jul 74, 145p
Grant PHS-RM-00007
This document is Study Paper number 19 of the Coordinating Board's Allied Health Project Study Committee on Nursing.

Descriptors: Texas, Registered nurses, Personnel development, *Nurses, Nurse aids, Licensed practical nurses, Health occupations, *Health manpower education, Health education, Curricula.

A multiple entry-exit curriculum model, developed by the Study Committee on Nursing of the Texas College and University System Coordinating Board's Allied Health Project during 1973 and 1974, is presented. The curriculum model provides career mobility for students from the nursing assistant through the baccalaureate degree in nursing; entry requirements for each level assure that only those with the potential to succeed will be admitted to the next higher level. The model is responsive to the desire for optimal career mobility and to current and projected nursing education needs. The conceptual framework for the curriculum centers on three theoretical concepts: utilization of the nursing process in deliberative nursing actions; man as a bio-psycho-social being; and the process of self and occupational development of the nurse. Following a discussion of the philosophy and objectives behind the curriculum, a curriculum summary is presented, including entry requirements for each nursing level, an outline of nursing courses for all educational levels, and behavioral objectives for each course. Definitions and terminal competencies are presented for the following nursing levels: nursing assistant, vocational nurse, associate degree nurse, and baccalaureate degree nurse. Criteria for implementation of the curriculum model in Texas are presented, followed by a glossary and selected bibliography. In addition to a detailed presentation of the curriculum model summarized in the text, the appendices include position statements on hospital and public school vocational nurse programs and on diploma schools; recommendations for implementation and evaluation; and a discussion of the open curriculum in nursing education.

HRP-0005826/3GA PC$3.50/MF$3.00
Montana State Dept. of Health and Environmental Sciences, Helena. Environmental Health Committee.
Work Program Fiscal Year 1973: Environmental Section.
4 Oct 72, 18p

Descriptors: Strategy, Plans, Occupational safety and health, Montana, Methodology, Implementation, *Health planning, Health care delivery, *Environmental health, Annual.

The work program of the Montana Environmental Health Committee for fiscal year 1973 is presented relative to the stated goal of an environmentally hazard-free habitat to be attained through promotion of that environmental quality which enhances healthful individual and family life and which precludes the impairment of human performance. For each objective stated, a list of accomplishments to date is presented, and the method to be utilized in the planning year is outlined. The method outline includes a description and schedule of responsibilities for the State agency staff, council, and committee. Objectives relate to the following: (1) preparation of a formal statement assessing the completed Environmental Site Permit System proposal; (2) stimulation of interest in environmental health planning among the public and among health professionals; (3) evaluation of the Citizen Cadre of Environmental Observers project and determination of the feasibility of proposing activation of similar projects in other areas of Montana; (4) support of efforts of other organizations, groups, and individuals directed toward promotion of environmental health.

HRP-0005988/5GA PC$5.00/MF$3.00
National Association of Counties Research Foundation, Washington, D.C.
Comprehensive Health Planning: A Manual for Local Officials.
Mel D. Powell, William P. Bodwitch, Bruce P. Fiedelman, and William C. Winter. 1972, 97p
Grant PHS-CH-36006

Descriptors: Objectives, Methodology, Health resources, Health related organizations, *Health planning, Government policies, Development, Data acquisition, *Comprehensive health planning.

A manual is presented by the National Association of Counties for use by local government officials in fulfilling their role in comprehensive health planning. The document emphasizes

that the primary objective of comprehensive health planning is not one of overcoming institutional barriers and exhausting resources in an attempt to restructure the local health delivery system, but is instead the development of policy, i.e., creating an awareness that interaction among diverse groups can lead to creative solutions to health problems. Guide One of the manual discusses the health system and the environment; factors affecting health services delivery, including costs and organization of services; the need for comprehensive health planning, including steps in the comprehensive planning process at the 314(b) level; and the role of local officials in comprehensive planning. Guide Two discusses the process of organizing for areawide comprehensive health planning, examines salient characteristics of the 314(b) agency, and discusses the community support building process. Guide Three considers the relationship between 314(b) agencies and other planning agencies, such as Councils of Government, Economic Development Districts, Model Cities, Office of Economic Opportunity health progams, and Regional Medical Programs. Methods of coordination are discussed. Guide Four discusses the formulation of community health goals. Guide Five outlines an approach to action planning, implementation, and program evaluation. The appendix includes a listing of sources of financial and technical support; a discussion of techniques for data collection; and listings of Department of Health, Education, and Welfare regional offices, 314(b) agencies, and 314(a) agencies.

HRP-0006066/5GA Not available NTIS
Social Security Administration, Washington, D.C. Div. of Health Insurance Studies.
Age Differences in Health Care Spending, Fiscal Year 1974.
Marjorie Smith Mueller, and Robert M. Gibson.
Jun 75, 14p DHEW/SSA-75/11700
Available from Office of Research and Statistics, Attention Mr. Robertson, 1875 Connecticut Ave. N.W., Rm. 1120, Universal North Bldg., Washington, D.C. 20009, single copy free.

Descriptors: United States, Patients, Methodology, Medical services, Measurement, Inpatients, Indexes(Ratios), Health care, Health care indexes, *Health care costs, Demography, Communities, Ambulatory health care.

The relationship of age to health care expenditures is examined. In 1974, persons under age 19, comprising over one-third of the population, had only 15 percent of the estimated $90.3 billion total health expenditures. Persons aged 19 to 64 made up 55 percent of the population and had about 55 percent of the health expenditures. Persons over 65 had almost 30 percent of the health expenditures while comprising only ten percent of the population. Per capita expenditures for all persons was $420 in 1974. In the same year, elderly persons spent an average of $1,218 per capita. Private payments accounted for 62 percent of all expenditures. Public expenditures for the aged averaged 60 percent. A total of $10.2 billion from Medicare and $3.9 billion from Medicaid provided 53 percent of total health care expenditures for those over 65. Expenditures for hospital care, the largest single item of health expense, represented 45 percent of all personal health care expenditures. Hospital care accounted for 33 percent of expenditures of those under 19, 48 percent of those 19 to 65, and 74 percent for those over 65. Physicians' services accounted for 31 percent of those under 19, 22 percent for those 19 to 64, and only 15 percent of the elderly's expenditures. Third party payments represented almost two-thirds of total health care expenditures by all groups in 1974.

HRP-0006141/8GA PC$4.00
Native American Health Center, San Francisco, Calif.
Study of Health Care Patterns Among Native Americans in the San Francisco Bay Area.
Michael Fuchs. Jan 74, 47p
Contract PHS-HSM-110-72-143

Descriptors: State regions, Sociology, Socioeconomic status, Socioeconomic factors, Minority groups, Health care, Demography, Communities, California.

A study of patterns of medical care utilization among American Indians in San Francisco, California, undertaken to determine how the socioeconomic position of this group compares with that of the population as a whole and with various population sub-groups and what barriers to receiving proper medical care are faced by urban indians, is reported. A total of 277 Bay Area Indian families were interviewed in a sample survey of San Francisco, Alameda, and Santa Clara Counties. Four Indian women, who had no previous experience, were recruited and trained to do the interviewing using a pretested questionnaire. Survey results showed the Indian population to be a young one, better educated than those on the reservations they had left, but poorer and more unemployed than any other ethnic group living in California. Thirty-seven percent of the families interviewed had no working members. The population represented had only 28 percent California Native Americans. Over 70 tribes were represented, including Navajos (8 percent) and Sioux (7 percent). Twenty-five percent of the families had at least one member who came to the Bay Area in a Bureau of Indian Affairs program. With regard to medical care, the Indian population shows all the problems common to poor people. Some 58 percent of families had at least one member with a health problem. A surprising finding with regard to insurance coverage was that almost 50 percent of the families with incomes of $6,000 or more were enrolled in the Kaiser pre-paid medical coverage program. The group having the most difficulty getting care is that with no coverage at all, comprising 20 percent of the sample. Survey results with regard to specific demographic, socioeconomic, cultural, and medical care characteristics are discussed. Supporting tabular data are included. A copy of the survey instrument is not included. A bibliography is provided. Portions of this document are not fully legible.

HRP-0006144/0GA Not available NTIS
Cincinnati Univ., Ohio. Dept. of Community Health Organization.
Consumer Participation in Health Planning.
Marvin D. Strauss. 1972, 88p
This document is number 32 of the Health Education Monographs.
Available from Health Education Monographs, Charles B. Slack, Inc., Thorofare, New Jersey 08086, $2.25.

Descriptors: Technical assistance, Strategy, Public relations, Public opinion, Public hearings, Participative management, Objectives, Methodology, Management, Local government, Health resources, Health related organizations, Health related individuals, *Health planning, Health education, Government policies, *Consumers, Community relations, Agencies.

An assessment of the significant issues involved in consumer participation in health planning is contained in this monograph, one of a series published by the Society for Public Health Education. Designed primarily for staff members of State and areawide comprehensive health planning agencies, these materials are also useful in continuing education and consumer education programs. The articles in the publication deal with legislative and administrative devices to foster consumer participation in health planning, pragmatic alliances of citizens' groups and citizens' lobbies, consumer-oriented national organizations, and consumer representation in all types of groups and organizations. Other articles are concerned with consumer participation as an end in itself, conflicts within the consumer movement, the power of consumers to force action, and the implied power of the consumer movement. A bibliography on consumer participation and health education publication abstracts are included.

HRP-0006162/2GA PC$4.00/MF$3.00
New Jersey Dept. of Higher Education, Trenton.
New Jersey Licensed Professional Nurses.
Jun 75, 47p

Descriptors: Supplies, Statistical distributions, Reserves, Registered nurses, *Nurses, *New Jersey, Methodology, Medical personnel, Measurement, Inventories, Health resources, Health occupations, Health manpower, Health care, Distribution, Demography, Communities.

Narrative and tabular data on licensed professional nurses in New Jersey are presented based on responses to the 1975 survey of New Jersey's licensed health professionals. Of the 64,202 professional nurses licensed in New Jersey, 63 percent responded to the survey. It is estimated that 39,039 (61 percent) of licensed register nurses (RNs) are presently practicing in New Jersey and 13,777 (26 percent) are inactive. The significant majority of RNs in New Jersey are white females. Over 67 percent of the RNs are diploma nurses and 18 percent hold baccalaureate degrees. An additional 1,256 nurses have masters degrees. Over half of the active nurses were educated in New Jersey and almost half were born in the State. Less than one third of the respondents indicated a nursing specialty. Of those indicating a specialty, medical-surgical nursing was first, followed by school health and geriatric nursing. Of those in active practice, 62 percent work full-time. There is little variation between active nurses and the entire licensed nurse pool; New Jersey active professional nurses are generally younger than the entire New Jersey population. Additional tabular data are appended.

HRP-0006198/8GA PC$3.50/MF$3.00
Bureau of Health Manpower Education, Bethesda, Md.
Coordination Among Health Agencies at the National Level: A Report.
Rod J. Badgewick. 1972, 22p

Descriptors: United States, Methodology, Management, Health resources, Health planning, Health occupations, *Health manpower, Coordination, Cooperation, Agencies.

The complexities of health manpower coordination among health agencies at the national level are explored in this paper presented to the 1972 Institute on the Development of More Effective Health Manpower Planning. Health manpower coordination requires a national health manpower strategy which can only be derived from a national strategy for health care delivery. It is noted that manpower strategies as of 1972 suffer from lack of common job descriptions, noncomparable and inadequate data, uncoordinated objectives, overlapping programs, and lack of tools for health manpower data development. Formal coordination mechanisms usually fare better than informal coordination. Presently, unless coordination is mandated, it is fragmented. Manpower efforts within DHEW are summarized, developments in the field of health manpower coordination are described. The latter include an interagency health manpower coordinating committee, a Bureau of Health Manpower Education in-house manpower coordination task force, and DHEW Planning Guidance System, which is a systems approach to organizing manpower reporting.

HRP-0006202/6GA PC$4.50
Erling Holland Associates, Tulsa, Okla.
Operation, Regulation, and Financing of Ambulance Services in Tulsa, Creek, and Osage Counties: An Aid for Long-Range Planning.
Thordis Holland. Jul 73, 74p

Descriptors: Transportation, State regions, Reviewing, Research, Oklahoma, Methodology, Health care, Health care services, *Health care delivery, Health care costs, Feasibility studies, Evaluation, *Emergency medical services, Comments, Assessments, *Ambulances.

A study of the operation, regulation, and financing of ambulance services in the three-county Tulsa, Oklahoma, planning area is presented, and the feasibility of establishing an ambulance district to serve all or part of the area is analyzed. The report documents the following: population characteristics and density; organization and operation of existing ambulance services; laws regulating operation of ambulance services; current costs of and revenues from ambulance services; estimated and projected demand for ambulance services; identification of political and economic factors which affect implementation of a specific course of action; definition of current problems in the operation and financing of ambulance services; analysis of alternate solutions; and recommendations. Based on study findings, development of a regional emergency medical service district including the five counties in the Tulsa Standard Metropolitan Statistical Area is recommended. Interim measures for improving ambulance service within the existing structure also are recommended, including the provision of helicopter emergency medical transport for the five-county area at the earliest feasible date. A proposed schedule of action relative to implementation of the recommendations is presented for the Tulsa Area Health and Hospital Planning Council. Supporting data are included.

HRP-0006221/6GA PC$4.00/MF$3.00
Stanford Univ., Calif.
Task Force on Nursing Education at Stanford University: Recommendations.
Susan J. Brueckner. Jan 73, 37p

Descriptors: State regions, Registered nurses, *Nurses, Health occupations, *Health manpower education, Health education, Curricula, California, Advanced programs.

Recommendations formulated by the Task Force on Nursing Education at Stanford University in California are presented. The major recommendation -- that a Master of Science in Nursing program be instituted -- is supported by six arguments concerning professional and graduate education. Further recommendations of the Task Force are: (1) preparation of advanced clinicians for expanded roles with a strong research orientation; (2) flexible and individualized curriculum with no fixed timetable or prescribed series of courses; (3) a directed research experience as part of the curriculum; (4) direction of the School of Nursing by an academically qualified nurse; (5) joint appointments to the nursing faculty mutually agreed upon by the School of Nursing and other departments; and (6) promotion and tenure of the nursing faculty consistent with practices of other faculties of the University. The rationale for training nurses for expanded roles as nurse practitioners and / or nurse specialists is discussed and supported by tabular data. Goals for the School of Nursing include strong participation in the University academic program and recruitment of nursing students from minority groups. Appendices detail responsibilities of nurse practitioners and clinical nurse specialists and contain a draft curriculum.

HRP-0006253/6GA PC$4.00/MF$3.00
California Univ., Berkeley.
Training Program for Consumers in Policy - Making Roles in Health Care Projects.
Lisbeth Meisner, Alberta W. Parker, Lee Austin, Cora Orr, and Mary Lou Ortega. 1969, 47p
Grant PHS-92007-66

Descriptors: State regions, Personnel management, Participative management, Orientation(Training), Methodology, Management, Local government, *Health planning, *Health education, *Consumers, Community relations, California, Agencies.

A training program for the consumer members of policy-making boards of three federally funded neighborhood health centers and one Model Cities health planning committee in the San Francisco Bay Area is described. Background information is provided for each of the centers and the Model Cities project, including funding, organizational structure, and community characteristics. The objectives of the training program, the Berkeley Consumer Health Project, are delineated, and staff members are identified. Formation of the policy-making boards, their liaison with the community, and the roles of the boards are discussed. Planning meetings, including the establishment of a workshop program, are outlined, followed by more detailed descriptions of eight workshops. These training workshops dealt with problems within the boards, professional personnel, confidentiality of information, emergency services, the politics of health, hiring community residents, and community representation. The second part of the workshop program was concerned with planning for programs within the individual centers. Finally, the workshop program was evaluated by its participants. Policy suggestions for future consumer training programs and participant comments are included. Portions of this document are not fully legible.

HRP-0006254/7GA PC$3.50/MF$3.00
California Univ., Berkeley.
Training Program for Consumers in Advisory or Policy Making Roles in Health Care Projects. Final Report. 1969-1970.
Lisbeth Meisner, Christine M. Swearingen, and Alberta W. Parker. 1970, 22p
Grant PHS-96005-69

Descriptors: State regions, Participative management, Methodology, Management, Local government, *Health planning, Health occupations, Health education, *Consumers, Community relations, California, Agencies.

The final report of the Berkeley Consumer Health Project, which involved the training of community representatives participating in Model Cities health planning committees, is presented. The Project was a continuation of a previously funded program to train consumers having advisory or policy-making responsibilities in neighborhood health centers. The Model Cities programs which the Project was designed to assist were in various stages of development; some were unorganized and not yet functioning. The Project staff decided not to develop an independent Model Cities training program, but to revive training sessions with the neighborhood health center groups and invite Model Cities staffs to participate. One Model Cities program and three neighborhood health centers agreed to continue. A series of workshops was planned around actual problems faced by one of the participant groups. The Consumer Health Project also became the liaison between consumer groups and professional and voluntary health groups. Publications based on the Project's experiences were prepared. Evaluation of the Project focuses on the reasons for failure to include Model Cities health consumers in the training programs.

HRP-0006258/6GA PC$5.50/MF$3.00
Community Services Administration, Washington, D.C. Div. of Services to the Aged and Handicapped.
Casework Services in Public Assistance Medical Care.
Sarah A. Butts. 1971, 118p DHEW/SRS-73/23017

Descriptors: Specialists, Registered nurses, Physicians, Personnel management, Orientation(Training), Nurses, Methodology, Management, Health planning, Health occupations, Health manpower, Coordination, Cooperation, Agencies.

Background medical information is provided to assist public assistance caseworkers in understanding physical ailments and assisting public assistance recipients in receiving treatment. The caseworker must have some knowledge of medical diagnoses and recommendations to be able to work with physicians in securing the best therapeutic measures for the client. The caseworker's contribution is his / her social evaluation of the patient, his family, and his community in the context of his need for medical care. The services of the public assistance caseworker and the public health nurse are complementary and a working relationship should be established easily. Channels of communication between hospitals and public agencies should be developed and information pooled. Some general observations about factors influencing underuse and overuse of medical care are explored. The responsibility of the caseworker in determining a recipient's need for care in his own home or in an institution is discussed, as are caseworker services in connection with recommendations for surgery and for treatment of terminal illnesses. Caseworker services related to the treatment of cancer, tuberculosis, heart disease, and rheumatism and arthritis are also discussed. A list of references is provided for each chapter.

HRP-0006266/1GA PC$4.50/MF$3.00
Management Sciences for Health, Cambridge, Mass.
Region I Family Planning Data System.
Final Rept.
30 Jun 75, 74p
Contracts PHS-HSA-105-74-185, PHS-HSM-110-73-521

Descriptors: Vermont, State regions, Rhode Island, Regions(United States), New Hampshire, Methodology, Massachusetts, Maine, Health care, Data processing, Data processing systems, Data analysis.

A regional data system designed to provide information for local management of family planning projects in the six-State New England region is described. The data system is divided into several components which are pictured in a flow chart. The input document is the National Reporting System Clinic Visit Record which is completed for each patient visit according to nationally specified procedures. Additional data are collected from current sites regarding geographic area, revisit type, fee scale, and student status. Output reports reflect the peculiar characteristics of each site in regard to service, resource utilization, patient characteristics, and third party and billing. A pilot third party billing system produces bills to third party payers from data submitted to the data system. A schematic drawing displays the functions of the pilot billing system. The most advantageous features of the regional system are: focus on decision-making, use of existing data, addressing of longitudinal problems, consistency with the national system, ease of modification, and use of existing technology. Appendices contain a list of projects and funding reports. Portions of this document are not fully legible.

HRP-0006286/9GA Not available NTIS
World Health Organization, Geneva (Switzerland).
Oral Health Surveys. Basic Methods.
1971, 54p
Available from the Q Corp., 49 Sheridan Ave., Albany, N.Y. 12210, $1.75.

Descriptors: United States trusts and territories, Surveys, Methodology, Health care, Data collection, Data acquisition.

Basic methods for performing oral health surveys to provide reliable epidemiological data for developing regional or national dental health programs are suggested. Steps involved in the planning of a dental health survey include: determination of objectives, selection of population groups to be included in the survey, receiving approval of the authorities, and training of participating examiners. The role of the World Health Organization is to provide technical assistance. Suggested oral assessment forms and procedures for using these forms are provided. Procedures for dealing with specific prevalent diseases are also suggested, as are methods of assessment of dental caries and periodontal diseases. General principles are listed concerning the preparation of sample survey reports. Annex One contains elective oral health assessment forms and techniques and Annex Two contains specimen forms for the presentation of basic data. References are included.

HRP-0006293/5GA Not available NTIS
Missouri Univ., Columbia. Dept. of Community Health and Medical Practice.
Between Patient and Health Worker.
Thelma Lee Dorroh. 1974, 271p
Available from McGraw Hill, 1221 Ave. of the Americas, New York, 10035, $6.50.

Descriptors: Health occupations, Health manpower education, *Health education, Continuing education, Allied health personnel.

Methods of improving patient care by improving interpersonal relations with patients are suggested for nonprofessional health workers. Because nonprofessionals provide almost 90 percent of all patient care, this book is designed to teach health workers to recognize that patients' attitudes and behavior can be understood and evaluated; to enable the health worker to realize how his background and experience influence his feelings toward patients; to help the health worker to realize his attitudes and behavior toward patients can be changed; and to aid the health worker in understanding that awareness and modification of his behavior will result in better patient care. Narrative examples of patient and health worker behavior provide a framework for learning experiences. Some of the experiences dealt with are: how the patient's family reacts to his illness, how patients deal with illness and injury, and special kinds of patients such as children. Other examples describe health care and the patient from the health worker's viewpoint. Guidelines for good human relations on the part of the health workers are proposed. A bibliography is included.

HRP-0006320/6GA Not available NTIS
World Health Organization, Geneva (Switzerland).
Health Practice Research and Formalized Managerial Methods.
F. Grundy, and W. A. Reinke. 1973, 195p
Available from Q Corp., 49 Sheridan Ave., Albany, N.Y. 12210, $4.00.

Descriptors: System analysis, *Operations research, Methodology, Mathematical models, Health care, Data processing, Data processing systems, Data analysis.

The principles of health practice research and managerial methods used to tackle health practice problems are described in this publication by the World Health Organization. Health practices research is concerned with organizational problems, i.e., with the planning, management, logistics, and delivery of services. A general introduction to health practice research is presented, primarily to provide basic information and definitions to readers completely unfamiliar with research methodology. Quantitative methods associated with management in general and health services administration in particular are discussed. Specific applications of management techniques are described, including information systems, analysis of indexes, and linear programming formulation, and the use of these techniques in disease control, estimation of health manpower requirements, and patient activity surveys is reviewed. Education and training of health manpower and the applications of research techniques to education are considered. The annex discusses certain practical considerations in health practice research. An annotated bibliography and a list of public health papers are appended.

HRP-0006321/4GA Not available NTIS
World Health Organization, Geneva (Switzerland).
Modern Management Methods and the Organization of Health Services.
1974, 103p
Available from the Q Corp., 49 Sheridan Ave., Albany, N.Y. 12210, $1.25.

Descriptors: System analysis, Health planning, Health care, Financial management, Data processing, Data analysis, Agencies.

An outline for technical discussions at the 1973 World Health Assembly on the subject of modern management methods and their use in health service delivery is provided. A background report deals with the symptoms of the need for better management techniques, the existing management situation, and how modern management techniques can be applied to health administration. Questions for discussion and a bibliography follow the background report. Management problems encountered by countries are described with regard to resources and costs; priorities, objectives, and evaluation; coordination; problems of change and reorganization; and information. Annexes provide suggestions for international action and an approach to the problem of priorities. The Chairman's address primarily deals with the use of management techniques by health manpower. A list of participants is included.

HRP-0006322/2GA Not available NTIS
Public Health Service, Bethesda, Md. Div. of Nursing.
Staffing of Public Health and Outpatient Nursing Services, Methods of Study.
Doris E. Roberts. 1963, 125p
Available from Q Corp., 49 Sheridan Ave., Albany, N.Y. 12210, $1.25.

Descriptors: Specialists, Registered nurses, *Nurses, Methodology, Medical personnel, Measurement, International relations, Health resources, Health related organizations, Health occupations, Health manpower, Health care, *Health care requirements.

A guide to assist public health agencies, including hospitals, to determine the number and composition of nursing staff necessary to carry out programs in public health and outpatient services is provided by the World Health Organization. General principles of staffing are explained as the basis for exploring staffing plans most appropriate to particular agencies and communities. Among the factors influencing staffing patterns are: population characteristics, characteristics of the nursing services, and professional group characteristics. Before staff requirements can be estimated, several planning decisions must be made. These include: selecting a method of analysis, determining data required for analysis, pre-testing of study methods, and obtaining job descriptions for all workers in the nursing department. A basic method for determining staff requirements is described in detail, followed by general descriptions of other methods of studying nursing staff requirements. These are all illustrated by charts and tables and instructions for completing forms. Other tabular data and a bibliography are appended.

HRP-0006408/8GA PC$11.00/MF$3.00
Genesee Region Educational Alliance for Health Personnel, Inc., Rochester, N.Y.
Genesee Region Health Manpower Report.
Mar 75, 407p

Descriptors: Supplies, State regions, Reserves, Physician extenders, Physician assistants, Nurses, New York, Methodology, Medical personnel, Measurement, Job analysis, Inventories, *Health resources, Health occupations, *Health manpower, Health care, Health care requirements, Allied health personnel.

Findings are reported of a 1974 survey of personnel employed in health care institutions in the ten-county Genesee Region of New York. Data on employed persons, budgeted positions, and employment openings are presented and analyzed for 150 occupations in: administration; dietary and housekeeping; laboratory services; mental health and counseling; nursing; radiologic services; rehabilitation services; social services; special personnel (e.g., optometrists, pharmacists, physicians' assistants; and special services (e.g., respiratory therapists, emergency medical technicians, operating room technicians). In addition to statistical analyses, the report provides information on demand for health personnel, an appraisal of potential supply through examination of regional health-related educational programs, and an estimate of future health manpower requirements. Brief reviews of national, regional, and local trends -- new education models, continuing education, ambulatory versus institutional care, national health insurance, government control, labor management, utilization review, normalization implementation, health career development -- are included, as are recommendations for research. The report provides details of survey methodology, supporting tabular data, a glossary of survey terminology, definitions of occupational titles by category, and a bibliography.

HRP-0006429/4GA Not available NTIS
San Francisco Unified School District, Calif.
Nutrition Education in Day Care Programs. A New Challenge to Our Profession.
Loretta Juhas. 1973, 4p
Pub. in the Jnl. of the American Dietetic Association v63 p134-137 Aug 73.

Descriptors: State regions, Sociology, Socioeconomic status, Socioeconomic factors, *Health education, Health care, Demography, Consumers, Communities, California.

Food service and nutrition education in day care centers are discussed as a part of the educational program of the center, rather than a function of the fiscal division which is concerned only with funding. Types of day care programs are described, and the standards for quality of service examined. The dietitian's role in both service and nutrition education is closely related to the teacher's role, as they employ a team approach concerned with the child's well-being. Questions of what foods to serve, in what quantity for each age group, and the introduction of new foods all are discussed, and the

need for a family-style, home-like meal service is stressed. Since young children learn through first-hand experiences, food-oriented activities can be used to supplement nutrition learning. An example is given of a teacher in a California center using corn as a unit lesson after a child who was snacking on cornbread asked how corn got to be bread. Cooking at day care centers is a favorite activity of the children, and they can expand the cooking lesson, as was done with the corn unit, into areas of arithmetic and chemistry, such as the use of baking soda and buttermilk as leavening agents. Professionals in nutrition education and dietetics are urged to find ways to expand their roles in well-rounded day care programs to include these important factors of nutrition and nutrition education relating to children.

HRP-0008428/1GA Not available NTIS
Valley Hospital, Ridgewood, N.J.
Staffing and Training for Intensive Care. Symposium on Intensive Care Units.
1971, 14p
Pub. in Medical Clinics of North America v55 n5 p1127-1140 Sep 71.

Descriptors: Strategy, Specialists, Registered nurses, Project planning, Nurses, Methodology, Medical records, Health planning, Health occupations, *Health manpower education, Health education, Health care, Data processing, Data processing systems, Curricula, Continuing education, Advanced programs.

Activities undertaken by the nursing service of a 325-bed acute care general hospital in anticipation of the establishment of a new eight-bed medical-surgical intensive care unit are described. Nursing service activities concentrated on the following: (1) participating, through representation on committees, in decisions determining nursing practices and procedures in the intensive care unit; (2) selecting and appointing a nursing supervisor; (3) establishing a nurse-patient staffing ratio; (4) assisting in the development of an intensive care unit course for nursing personnel; (5) coordinating the specific aspects of the training course; (6) assisting in the design of records and forms for use in the unit; and (7) setting minimum criteria for selection of personnel seeking assignment to the intensive care unit. Following an outline of questions which can be utilized by any nursing service administration in preparing for an intensive care unit, the aspects of staffing, training program development and implementation, and development of patient records are discussed in detail. The establishment of nursing prerogatives, i.e., the parameters within which nurses have the authority to act in the absence of a physician in the intensive care unit, is considered briefly. A proposed instructional program for training intensive care unit nurses and sample copies of patient forms for the unit are included. A bibliography is provided.

HRP-0008436/6GA PC$4.50/MF$3.00
Mountain Ramparts Health Planning, Inc., Asheville, N.C.
Areawide Comprehensive Health Plan. Edition Number Two.
1975, 68p
Grant PHS-04-P-0000-19-04-2

Descriptors: Systems, State government, *Rural health services, Rural areas, Plans, North Carolina, Methodology, Local government, Health planning, Health care services, *Health care delivery, Health care delivery systems, Development, Data acquisition.

An areawide comprehensive health plan for a four-county rural area in the mountains of North Carolina is provided. Parts of the area are isolated from needed services and are characterized by a poor transportation system. Demographic data are displayed in charts and tables. A regional health profile lists 65 health-related services, as well as health facilities and health manpower available within the region. Major problems, in order of priority, are: availability and accessibility of physicians, need for additional long-term care facilities, shortage of paramedical personnel, care for the medically indigent, and acute care hospital facilities. Planning and project goals are enumerated for the following components of the health care system: primary care, hospitals, services for the aged, long-term care, mental health services, the mentally retarded and handicapped, emergency medical services, and environmental health. The need for skilled and intermediate care nursing beds is forecast for 1980 based on a 1975 survey of nursing facilities in the region. Recommendations for action are suggested for each of the system components. Reports of the hospital, long-term care, and physician access committees are included. Portions of this document are not fully legible.

HRP-0008442/8GA Not available NTIS
Pennsylvania Univ., Philadelphia.
Study Provides Data for Planning Hospital-Based Primary Care.
Ralph Ullman, James A. Block, Marshall V. Rozzi, and William C. Stratmann. 1975, 6p
Pub. in Hospitals, Jnl. of the American Hospital Association, v49 p75, 77-78, 80 16 Nov 75.

Descriptors: Urban areas, State regions, Research, Patients, New York, Methodology, Measurement, Inpatients, Health care, Health care services, Health care requirements, Health care delivery, Ambulatory health care.

A methodology is presented for identifying the current patient population, considered essential for the planning of a hospital primary care program. At Genesee Hospital in Rochester, New York, a primary care group practice was developed to replace the outpatient department. The hospital's Health Services Research Center undertook a study to identify the primary care population in the traditional clinic setting, using a sampling technique that was dependent on a list of visits made within a given period and a unit medical record, in which all services rendered to an individual patient are recorded. Some general conclusions drawn from the study were: the derived age distribution of the existing primary care population suggested that pediatric care for newborns and maternity care for teenagers should be stressed in the design of a new program; a neighborhood health center model does not fit the utilization patterns in the primary care population; and 65 percent of the patients have Medicaid coverage, which is favorable to the financial stability of the proposed program. It is noted that the data derived and used in this study was organized to meet a unique set of circumstances and may not fit other situations.

HRP-0008443/6GA Not available NTIS
American Medical Record Association, Chicago, Ill.
Modified Problem Oriented Medical Records in the Long Term Care Facility.
Sonya Slater, and Shirley Gilday. 1974, 123p
Available from American Record Association, 875 North Michigan Ave., Chicago, Ill. 60611, $7.98.

Descriptors: Methodology, *Medical records, Health care, Data processing, Data processing systems.

A manual for implementing a modified problem charting method which enhances the picture of the patient in a long-term care facility is provided by the American Medical Record Association. Sample forms illustrate the compilation of the patient's history and its entry into a data base. Nursing assessment forms, to be filled out by patient or family, provide a broad overview of the patient's life style, affiliations, hygiene, and perceptions which can assist in problem-solving. A problem list is compiled to provide a simple statement of past, current, and ongoing problems of the patient based on the history and the nursing assessment. Progress notes and orders provide a uniform method of documenting the patient's assessment and treatment plan for all personnel involved in the direct care of the patient. Flow charts are detailed plans of care for an identified problem, documentation of the procedure done, and a graph of the patient's progress. These flow charts provide a uniform method of documenting the detailed care plan for each discipline involved in the patient's care. Laboratory reports are used to record results of various tests in chronological order. A summary sheet facilitates retrieval of all information from a single source and provides an inclusive format for information needed in the long-term care facility.

HRP-0008448/9GA Not available NTIS
Institute of Medicine, Washington, D.C.
Infant Death: An Analysis by Maternal Risk and Health Care.
1973, 218p
Available from the National Academy of Sciences, 2101 Constitution Ave., Washington, D.C. 20418, $6.00.

Descriptors: Vital statistics, State regions, Sociology, Socioeconomic status, Socioeconomic factors, New York, Mortality, Indexes(Ratios), Health status indexes, Health care, Health care utilization, Health care indexes, Demography, Communities.

Infant birth and mortality statistics for New York City are used to examine differences in the need for and receipt of health services by women during pregnancy. Statistics on births during 1968 were obtained from the City on mother's race and nativity, parents' education, prenatal care visits, hospitals where birth occurred, attendant at birth, mother's health, infant's health, and details of labor. Mothers were classified in four risk groups: one no-risk group and three at-risk groups based on social factors and medical conditions. More than three-fifths of white, native-born women were no-risk; one fourth of the Black women were no-risk. Conclusions of the study were: (1) adequacy of care is consistently associated with infant birth weight and survival; (2) the survival of infants of different ethnic groups varies widely; (3) there is a consistent association between the mother's educational attainment and the child's birth weight and survival; and (4) there are major differences in the distribution of risk categories according to the mother's ethnic group. It is suggested that maternal and infant health projects ease high infant death rates in project areas. The primary finding of the study is that, with adequate care, there are smaller differences in infant death by ethnic group. Tabular data are included. Appendices contain supplementary tables.

HRP-0008472/5GA Not available NTIS
Fogarty International Center, Bethesda, Md.
Medical Assistant: An Intermediate Level of Health Care Personnel.
D. M. Pitcairn, and D. Flahault. 1974, 172p
This document (Public Health Papers number 60) contains the proceedings of an International Conference held at the National Institutes of Health, Bethesda, Md., on June 5-7, 1973.
Available from the Q Corp., 49 Sheridan Ave., Albany, N.Y. 12210, $4.00.

Descriptors: Registered nurses, Physician extenders, *Physician assistants, Nurses, Health resources, Health occupations, Health manpower, *Health manpower education, Health education, Foreign countries, Allied health personnel.

Proceedings of an international conference on medical assistants and other auxiliary health personnel are presented. Sponsored by the Fogarty International Center for Advanced Study in the Health Sciences and the World Health Organization, the three-day conference brought together representatives of selected developing countries, and persons engaged in training auxiliary health personnel in the U.S. Papers were presented on the following topics: trends in the education and training of health personnel; current programs in the U.S.; training physicians' assistants and associates, nurse practitioners, child health associates, and primary care medical practitioners, and MEDEX; and the community health medic in Indian America. Other topics included medical assistants as viewed by physicians and by nurses. Group discussions were held on the roles for the medical assistant -- training, career status, and public and professional acceptance. In the area of quality assurance, competence, and accountability, discussions of accreditation and legal aspects were held. The epilogue contains the principal accomplishments of the programs, principal obstacles and problems, and prospects for the future. A bibliography and list of participants is provided.

HRP-0006486/5GA Not available NTIS
Upper Midwest Research and Development Council, Minneapolis, Minn.
Indicators of Need for Health Care Personnel: The Concept of Need, Alternative Measures Employed to Determine Need, and a Suggested Model.
Ivan J. Fahs, Thomas Choi, Kathryn Barchas, and Paula Zakariasen. 1970, 8p
Contract PH-43-68-691
Pub. in Medical Care v9 n2 p144-151 Mar-Apr 71.

Descriptors: Minnesota, Methodology, Medical personnel, Measurement, Health resources, Health occupations, *Health manpower, Health care, *Health care requirements.

Selected categories of need indicators are examined in relation to the functions of health care personnel. Persons making decisions about the role of health care personnel are confronted with an array of measurements that allegedly determine need. One category of need indicators examined in the present study analyzes those which compare numbers of health personnel to population. A second category of need indicators analyzes health personnel need as indicated by economic factors, while a third category examines personnel need as indicated by factors of geographic distance. It is noted that there are both advantages and disadvantages in using any one indicator, and there is greater reliability in using more than one indicator. Most indicators used can be derived from available information, but the indicator utilized should fit health needs. Experience with demographic and health information in Minnesota in regard to need indicators suggested that levels of medical care ought to be compared to a hierarchy of economic functions. Under such a comparison, centers of specialty medical care would be related to more economically viable centers and convenience medical care to other population centers. It is recommended that caution be exercised in delineating a need for health manpower personnel, based on the need indicator model developed in Minnesota.

HRP-0006488/1GA Not available NTIS
Stritch School of Medicine, Chicago, Ill.
Physicians and Poverty Programs.
Marcel A. Fredericks, John Koss, Joel J. Albert, and Leon S. Robertson. 1970, 6p
Pub. in Hospital Progress v52 n3 p57-61 Mar 71.

Descriptors: United States, Statistical distributions, *Physicians, Health resources, Health occupations, *Health manpower, Health care, Distribution, Demography, Communities.

Findings are presented of a survey of 1,008 physicians selected randomly from the American Medical Directory to determine physician attitudes concerning leaving their present positions in favor of teaching, research or work with a poverty program. Results of the survey, which had a 76 percent response, indicate that approximately half were willing to change positions; those willing to change positions favored positions in academic medicine. Only four percent were willing to accept a position with a poverty program, although 16 percent would accept such a position as a second alternative. Physicians who had recently graduated from medical school and who were presently holding fully salaried positions but were without board certification were more willing to work in a poverty program. Respondents in private practice were not willing to change positions. There was a consistent inverse relationship between age and willingness to change positions. Almost 70 percent of physicians over 70 were unwilling to change, while 14 percent of the youngest group were amenable to changing positions. The question is raised whether medical schools, in addition to meeting their traditional responsibilities of teaching and research, can assume responsibility for the medical manpower aspects of the poverty programs. One proposal for meeting the physician needs of poverty areas is development of a national medical insurance program which would cover the entire population and would assure the patient of a choice of physician.

HRP-0006513/6GA PC$5.00/MF$3.00
Upper Midwest Research and Development Council, Minneapolis, Minn.
Nursing in the Upper Midwest. Focus on the State of North Dakota.
Ivan J. Fahs, and Kathryn Barchas. Nov 69, 83p

Descriptors: Objectives, *Nursing, Nurses, *North Dakota, Methodology, Measurement, Health planning, Health occupations, Health care, Health care utilization, Health care requirements, Government policies.

Nursing resources, utilization, and a project of future nursing needs in the State of North Dakota are presented in this study which is part of a larger report on Nursing in the Upper Midwest. This study, conducted by the North Dakota Joint Committee on Nursing Needs and Resources, was intended to facilitate planning recommendations about nursing. The history of nursing in the area is discussed, as well as demographic, economic and health care trends which affect health care. The State is characterized by a small population, high dependency ratios, substantial out - migration rates, great geographic distances, and low industrial activity, all of which act as constraints on health programs. On the other hand, the large amounts of open space, clean air, and congenial social cohesion among population groups may act as facilitators of innovative health programs. Nursing care must adjust itself to the unique features of the State, which has developed a distinct system of delivering health care to its people. In North Dakota, the hospital utilization is high, the ratio of nurses to physicians is high, distances are great, the population is dispersed, life expectancy is long, and infant mortality is low. How these factors relate to health planning is uncertain but it is stressed that they be considered in planning. In addition, the earnings of nurses should be considered. Variations in earnings exist between urban and rural areas, and among types of nursing positions. North Dakota pay scales have been consistently below the national average. One objective of the study was to assess the need for nursing care. References and a glossary are provided.

HRP-0006516/9GA PC$4.50/MF$3.00
Alabama Board of Nursing, Montgomery.
Assessment of Nursing Education in Alabama.
Margaret J. Koehler. 1968, 65p

Descriptors: Universities, Students, Schools, Research, Registered nurses, Recruiting, Nurses, Methodology, Medical education, Instructors, Health resources, Health related organizations, Health occupations, Health manpower, *Health manpower education, Health education, Health care delivery, Faculty, Employment, *Alabama.

Results of a comprehensive survey of nursing education in Alabama are presented by the Alabama Board of Nursing. The study was undertaken to achieve direction for immediate planning for nursing education programs, and to obtain a sound basis for formulating goals for nursing education in the future. Inventories were developed of health-related institutions and agencies in the State (number, size, and location), and type and location of schools of nursing and institutions of higher learning. A register was developed of active and inactive nurses in the State including data on number, educational preparation, age and area of practice. Mobility data of nurses moving in and out of the State were gathered, together with pertinent information concerning student applications, admission, enrollment and graduation in nursing education programs. A profile was developed of entering freshman nursing students, and recommendations were formulated for the planning and improvement of nursing education in Alabama. Recommendations included: implementation of a large-scale recruiting effort; conducting of nurse utilization studies by individual agencies and institutions; cooperation between areawide Comprehensive Health Planning Groups and professional nursing organizations; and employment of a State consultant on paramedical programs in junior colleges. Other suggestions related to appraising legislators of this report, but with emphasis on a cautious approach to establishing new schools; and the continuation of diploma programs until such time as baccalaureate and associate degree programs can fill the nursing needs. Similar studies are recommended to be undertaken every five years. Appended are the survey instruments, lists of approved schools of nursing, nursing education cost analysis, and a bibliography.

HRP-0006572/2GA PC$3.50/MF$3.00
Wisconsin Governor's Health Planning and Policy Task Force, Madison.
Health Care for Wisconsin.
Summary Rept.
Nov 72, 25p

Descriptors: *Wisconsin, State government, Public relations, Methodology, Management, Local government, Health resources, Health related organizations, Health planning, Government agencies, Agencies.

A summary of the 1972 report of the Governor's Health Planning and Policy Task Force to the 1973 Wisconsin State Legislature is presented for the benefit of the citizens of the State. The summary includes brief discussions of Task Force findings relative to: the definition of acceptable health care; problems in the existing health care delivery system; what is meant by the health care 'crisis'; the State's role in dealing with health care problems; provision of services to individuals with special health problems (the mentally ill, alcoholics, developmentally disabled, the elderly, children, those in need of emergency care); the need for public information concerning health services; assuring that individuals have access to health care regardless of ability to pay; assuring that health services are of high quality; and assuring that an adequate supply of health care workers ex-

lists. The recommended creation of a Health Services Commission for Wisconsin is discussed, as is the need for coordination and cooperation in the development of health planning capabilities in the State. A list of issues concerning which the Task Force recommended that action be taken by the Legislature is provided.

HRP-0006632/4GA PC$4.00/MF$3.00
Oklahoma Board of Nurse Registration and Nursing Education, Oklahoma City.
Assessment of Nursing in Oklahoma - 1970 - Summary Report and Recommendations.
Feb 71, 30p

Descriptors: Supplies, State regions, Reserves, Registered nurses, *Oklahoma, Nurses, Methodology, Medical personnel, Measurement, Licensed practical nurses, Inventories, *Health resources, Health occupations, Health manpower, Health manpower education, Health education, Health care.

Results are reported of a study initiated by the Oklahoma Board of Nurse Registration and Nursing Education to obtain information that would assist individuals and groups to plan effectively for health care services in the State. The primary objective of the study was to gather available information relating to nursing and nursing education in Oklahoma which could serve as a basis for an assessment of the current situation and provide direction toward the goal of providing adequate nursing resources for State residents. Four primary elements were identified and information was obtained to analyze these elements and their effect on the supply of nursing resources: (1) continuing disparity between the supply of nursing personnel and the demand for nursing services, especially in rural areas; (2) complexities of nursing education; (3) changing roles and functions in nursing practice; and (4) inherent weaknesses of nursing as a lifetime career. Eleven regional profiles in Oklahoma were used to review resources of the State as a whole. Study results and recommendations are presented in terms of statewide planning, delivery of health care services, nurse manpower (registered and licensed practical nurses), nursing education, financing of nursing education, continuing education nursing, and continuing evaluation of nursing resources. It was concluded that the adequacy of health care depends as much on the manner in which it is organized and delivered as upon the number of available nurses. A list of references is included.

HRP-0006719/9GA Not available NTIS
Mount Sinai Medical School, New York. Dept. of Community Medicine.
Principal Components Analysis of the Distribution of Physicians, Dentists and Osteopaths in a Midwestern State.
Carter L. Marshall, Khatab M. Hassanein, Ruth S. Hassanein, and Carol L. Marshall. Jun 70, 9p
Pub. in American Jnl. of Public Health v61 n8 p1556-1564 Aug 71.

Descriptors: Statistical distributions, Statistical analysis, *Physicians, Methodology, *Kansas, Health resources, *Health manpower, Health care, Distribution, Demography, Data processing, Data processing systems, Data analysis, Communities.

A study of demographic variables characteristic of urban and rural counties in Kansas which tend to attract or repel physicians is documented. Demographic variables believed to be of potential importance were collected and calculated for each of the 105 counties in the State. Eighteen variables, based primarily on 1960 U.S. Census data, were combined into factors by principal components analysis. Factor scores for each county were computed and each of three variables relevant to physician manpower (physicians per capita, average age of physicians, and proportion of physicians less than 60 years old) were regressed separately on these factor scores. The results suggest that a distinction should be made between affluent and poor rural and urban areas with respect to medical manpower deficits, and that an affluent but sparse population does not attract medical personnel. Population size appears to be the single most important element in determining physician location. Supporting tabular data and details of analysis methodology are included.

HRP-0006723/1GA Not available NTIS
Kentucky Univ., Lexington. Dept. of Community Medicine.
Health in Rural Poverty: Some Lessons in Theory and from Experience.
David Steinman. 1970, 11p
Pub. in American Jnl. of Public Health v60 n9 p1813-1823 Sep 70.

Descriptors: State regions, Sociology, Socioeconomic status, Socioeconomic factors, Rural areas, Projects, *Medical services, Kentucky, Innovations, Health status indexes, Health occupations, Health manpower, Health care, *Health care utilization, Health care technology, Health care services, Health care delivery, Demography, Communities.

Based on the experience of a multiphasic health screening program involving adults and children of Martin County, Kentucky, barriers between the rural poor and providers of medical services are discussed, and ways of increasing utilization of health services among the rural poor are considered. Disease patterns in Martin County, based on clinical examinations of 220 infants, 832 children, and 1,116 adults, are described and compared with National Health Survey data. Factors found to influence the reduced utilization of medical services in Martin County include geographic isolation, concentration of services in urban centers, and inability to afford medical care. Generally, the Martin County experience indicated that the poor would respond in large numbers to services that are readily accessible and properly organized to provide a measure of privacy and dignity. The use of 'home-front' workers, middle-aged females from the community who visited the homes of individuals to describe screening procedures and to schedule families for examination, proved successful. In recognition of the need for a broadly based referral service, a multi-agency referral center was established in Martin County, and initial efforts were focused on increasing utilization of existing medical care resources. It is concluded that individual and family beliefs, attitudes, and values affect health status and the ability to obtain appropriate service. In turn, attitudes, values, and health status are affected by one's social level. It is suggested that the interaction of the provider and the patient demands further analysis.

HRP-0006735/5GA Not available NTIS
Department of Agriculture, Washington. Economic Development Div.
Rurality, Poverty, and Health: Medical Problems in Rural Areas.
Feb 70, 13p
This document is number 172 of the Agricultural Economic Report Series.
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $.30.

Descriptors: Statistical distributions, Sociology, Socioeconomic status, Socioeconomic factors, Rural areas, Health resources, Health care, Health care services, Demography, Communities.

Health-related problems of the rural poor are discussed, and possible approaches to dealing with these problems are considered. The problem of rurality, poverty, and health is described as a circular one. In rural areas, income is generally lower and medical services are generally poorer and less accessible than in urban areas. At the same time, the incidence of chronic illness, which limits work activity and thus reduces income, increases with both rurality and low family income. Farmers, in general, experience a high rate of this type of illness. In addition, the shortage of emergency services in rural areas contributes to the very high accident fatality rate in farming. Quantative and qualitative factors intensify the rural health care problem. Low incomes and sparse populations prevent rural areas from competing effectively in the medical marketplace; consequently, deficiencies exist in both quantity and quality of rural-located medical personnel and facilities. Although general practitioners are evenly distributed by population density, areas of high population density and high household incomes attract more specialists and hospital-based physicians, thereby often reducing the quality of care available to rural residents. Programs underway or being planned to help solve the problem include increasing the supply of services, reorganizing existing services and developing new ones on the basis of regional needs, and removing income and other barriers which impede the ability of the poor to obtain medical care. Specific suggestions are offered for further steps to be taken, in the public and private sectors, to assure prompt access to regular and emergency health care for rural residents. Supporting statistics and a bibliography are included.

HRP-0006807/0GA Not available NTIS
Virginia Commonwealth Univ., Richmond.
Preparing Tomorrow's Health Care Team.
Elizabeth J. Mason, and John Parascandola. 1972, 4p
Pub. in Nursing Outlook v20 n11 p728-731 Nov 72.

Descriptors: Wisconsin, Universities, State regions, Schools, Medical education, Health resources, Health related organizations, Health occupations, Health manpower, *Health manpower education, Health education, Curricula.

Efforts of faculty members at the University of Wisconsin to provide increased interaction among students and faculty in the various health disciplines are described. An interdisciplinary planning group, composed of faculty representatives from the areas of communicative disorders, medicine, nursing, nutritional sciences, occupational therapy, pharmacy, physical therapy, and social work, was established to develop a series of courses that would form a health services core. The first core course offering was made in the second semester of the 1970-71 academic year, and was entitled 'Health Care Systems -- An Interdisciplinary Approach.' Some 70 students, ranging from freshman to seniors who were majors or prospective majors in health services fields, enrolled in the lecture-discussion course. The second step involved a pilot study in which students participated in health teams in a clinical setting, i.e., the Diagnostic and Treatment Unit of the University's Center on Mental Retardation. The content of both the lecture and the clinical course is described, and faculty and student evaluation of each is summarized. The interdisciplinary planning group, at the time of writing, was continuing to meet and to develop the health services core, faculty members from additional disciplines having joined the group. In addition to the introductory health services course, efforts were underway to expand interdisciplinary clinical experiences into inpatient settings as well as into the community.

HRP-0006933/6GA Not available NTIS
Colorado Univ., Denver. School of Medicine.
Family Nurse Practitioners in Eastern Kentucky.
Richard F. Kirk, Joseph D. Alter, Helen E. Browne, and Judith Davis. 1970, 6p
Pub. in Medical Care v9 n2 p160-168 Mar-Apr 71.

Descriptors: Registered nurses, *Nurses, Kentucky, Health occupations, Health manpower, *Health care utilization.

The activities and functions of a group of family nurse practitioners in the rural Appalachian area of Eastern Kentucky are documented to determine which functions they perform beyond those which nurses traditionally perform. The nurses studied were members of the Frontier Nursing Service (FNS) of Leslie County, Kentucky, where there are only three physicians for 10,100 people. The Frontier Nursing Service operates a 26-bed hospital staffed by nurses, with two physicians employed to provide both inpatient and outpatient care. Six outposts provide primary medical care by registered nurses to the surrounding areas. Requirements for entering the FNS consist of an RN degree, ability to assume responsibility, and a concern for patient care. About 60 percent of the nurses have taken courses in nurse - midwifery. Nurses in the Service have learned to define patient conditions and then decide whether to treat directly or refer to a physician. A questionnaire given to 15 FNS nurses showed that most learned basic pharmacology and physical examination procedures in nursing school; they also learned indications and contraindications of medication and to give and refill prescriptions under physician supervision. At the FNS, the nurses have learned to take more responsibility and to make judgments concerning initiation or discontinuation of medication. The nurses of the FNS assume the responsibility for providing primary care for a majority of people in their service area.

HRP-0006935/1GA Not available NTIS
Organizational Issues in the Team Delivery of Comprehensive Health Care.
Richard Beckhard. 1972, 29p
Pub. in the Milbank Memorial Fund Quarterly, v50 n3 p287-316 1 Jul 72.

Descriptors: Reviewing, Research, Organization theory, Methodology, *Health resources, Health related organizations, Health manpower, Health care, Health care utilization, Health care services, *Health care delivery, Feasibility studies, Evaluation, Comments, Assessments.

Organizational issues in the team delivery of comprehensive health care are discussed and compared with methods used in other settings for analyzing and improving organizational effectiveness. The variety of needs and expectations of patients and their families, the variety of backgrounds of medical and social health workers and the necessity to have integrated team diagnoses and treatment of interrelated medical and social problems in patient families are noted. Major issues to be addressed by organizational leadership are identified as follows: helping primary care teams integrate their diagnosis and treatment; providing an organizational structure that reflects work requirements; dealing with human problems unique to the team situation; locating authority and developing competence; building communication patterns and linkages between practitioners and the support system; maintaining a patient-oriented delivery system; and retaining an effective staff. Several categories of criteria against which organizational effectiveness can be measured are identified. Implications for the education of health workers are discussed.

HRP-0006984/8GA Not available NTIS
Sacramento City Coll., Calif.
You Can't Be a Team By Yourself.
Elaine Gordon, and Patricia Adams. 1971, 4p
Pub. in the International Nursing Review, v18 n1 p76-79 1971.

Descriptors: Reviewing, Research, Registered nurses, *Nurses, Methodology, Licensed practical nurses, Health occupations, Health manpower, Health care, *Health care utilization, Health care delivery, Feasibility studies, Evaluation, Comments, Assessments.

Factors in successful nursing team relationships are discussed. It is noted that a profession exists when there are bonds between practitioners, and that nursing is focusing its attention on these bonds in the form of team nursing. A patient-centered, team-oriented theory of nursing is presented. The importance of respect between team members is noted, as is the value of a plan of action in providing an atmosphere of security for team members. It is further observed that lines of authority and areas of responsibility must be defined, and that good communication is essential in encouraging team members to be supportive of one another. Positive interpersonal relationships between licensed practical nurses and registered nurses as health team members are vital. The immediate need for strengthening bonds between all nurses can be met by making the nursing population aware of the attributes of team nursing. It is recommended that attention always be focused upon changes which will improve nursing care.

HRP-0007011/0GA PC$4.50
Department of Health, San Juan, Puerto Rico.
Study of Nursing Resources in Puerto Rico.
Ernestina Osorio. 1967, 61p

Descriptors: Supplies, Reserves, Registered nurses, *Puerto Rico, *Nurses, Methodology, Medical personnel, Measurement, Inventories, Health resources, Health occupations, *Health manpower, Health care, Health care requirements.

A study of nursing manpower resources in Puerto Rico, initiated in October, 1964, by the Division of Nursing, Health Bureau, Puerto Rico Department of Health, is documented. A questionnaire was sent to 3,800 employed and unemployed registered nurses in Puerto Rico; 2,500 responses were received. Additional data were gathered from Commonwealth hospitals, clinics, and home visiting services. Statistics are presented on the education and background of the nurse population, utilization of nursing manpower in Commonwealth hospitals and public agencies, distribution and fields of employment of nurses, enrollment in nursing education programs, and other areas. Among study findings are the following: (1) as of 1966, 14 percent of nursing positions in Puerto Rico remained vacant; (2) recruitment of at least 300 new students per year by school facilities is required to fill the vacancies; (3) there is difficulty in recruiting and retaining nursing instructors due to the classification of this position at the same level as the general duty nurse; (4) 2,097 of the 2,500 nurses surveyed had not received academic preparation at the college level. Tabular data supporting these and other findings are included, as are a description of study methodology and an analysis of nursing manpower needs, as of 1966, for Commonwealth government hospitals and Commonwealth Health Department clinic and home visit services. Portions of this document are not fully legible.

HRP-0007016/5GA PC$5.00
Texas Nurses Association, Austin.
Report on Nursing Resources in Texas: 1966.
Virginia Jarratt, Jessie M. Scott, and Helen Forest. 1966, 89p

Descriptors: United States, *Texas, Supplies, State regions, Reserves, Registered nurses, Regions(United States), *Nurses, Methodology, Medical personnel, Measurement, Licensed practical nurses, Inventories, *Health resources, Health occupations, *Health manpower, Health care, Health care requirements.

Characteristics of the nursing resource supply in Texas in 1966 are reported, based on a study initiated by the Committee on Nursing Needs and Resources in Texas. The primary source of data for the study was licensure statistics from the Texas Board of Nurse Examiners. Information on 35,930 of the 38,862 nurses licensed in Texas (97.5 percent) in 1966 was obtained. Computerized programs were utilized to obtain and analyze data on State and out-of-state nurses. Trend data were collected and presented when possible to facilitate comparisons and national statistics and those from surrounding States are included for comparison purposes. The study results are presented in the form of statistical data representations. Tables are grouped into the following categories: population statistics and personnel-population ratios, health facilities, and nurse supply (numbers, characteristics, and education). Each section of tables is preceded by brief comments relating to the data. Included at the end of the report are comments, questions, and suggestions for additional information on the supply of nurses in Texas. Portions of this document are not fully legible.

HRP-0007022/7GA PC$5.50/MF$3.00
Pan American Health Organization, Washington, D.C. Sanitary Bureau.
Report of the Survey of Schools of Nursing in the Caribbean Area: March 1964 - August 1965.
Jul 66, 110p

Descriptors: Universities, Schools, Registered nurses, *Nurses, Medical education, Licensed practical nurses, Health resources, Health related organizations, Health occupations, Health manpower, *Health manpower education, Health education, Foreign countries.

A survey conducted by the Pan American Health Organization, to assess nursing resources and nursing supply in the Caribbean area, is reported. The types of data collected and methods used to collect the data from an area considered undeveloped may be useful to planners in similar situations. Five survey objectives were identified: (1) to assess nursing education and nursing service resources in the area of the English - speaking Caribbean and adjoining territories as a basis for future planning to improve nursing care in the countries; (2) to determine the type and number of nurses needed, taking into consideration health problems of the area and its financial possibilities; (3) to develop a long-range plan for improving nursing education; (4) to examine the advisability and feasibility of establishing a regional body or council with authority to assess and recognize schools of nursing within the area so that reciprocity could be established from one territory to another; and (5) to assist in the improvement of nursing schools through the provision of advisory services, fellowships for the preparation of teaching staff, and aid in security equipment. The 13 territories of the Caribbean area covered by the survey included 11 West Indies island territories and the mainland territories of British Honduras and British Guiana. Four project phases were envisioned: collection of factual information, evaluation of this information, formulation of plans for the improvement of nursing education, and plan implementation. Data on the schools surveyed are presented in terms of general information, organizational and administrative aspects, teaching personnel, student personnel services, student selection and organization, counseling programs, student health services,

nurses' homes, supervision, living in, financial assistance to students, curricula, evaluation of programs and students, libraries, setting for education programs, clinical facilities, and educational facilities for schools of nursing. Ten report appendices provide additional information on survey methods and results. Portions of this document are not fully legible.

HRP-0007060/7GA PC$5.00/MF$3.00
Public Health Service, Bethesda, Md. Div. of Hospital and Medical Facilities.
Hospital Services in the U.S.S.R. Report of the U.S. Delegation on Hospital Systems Planning, June 28-July 16, 1965.
Nov 66, 85p

Descriptors: Research, Patients, Medical services, International relations, Inpatients, *Health resources, Health related organizations, Health manpower education, Health education, *Health care services, Health care facilities, Health care delivery, Health care costs, Foreign countries, Financing.

The visit is reported of a U.S. delegation to the Soviet Union in an exchange program to observe that country's hospital planning system and to examine the relationships among medical care, health services education, research, and hospital operation. No attempt was made to study the Soviet system of mental hospital care or to study in any detail the system of sanatorium and rest home care. The delegation visited five major cities in four different republics of the Soviet Union. Nineteen hospitals were visited: eight general adult hospitals, five medical research institutes, two maternity hospitals, two tuberculosis hospitals, one children's hospital, and one rural district hospital. In addition, the delegation visited six polyclinics, saw one central emergency service for a large city, and had ten major conferences with high-level Soviet officials. The relationship of government to health care was examined. Health services education was surveyed in terms of both medical and paramedical education. The Soviet hospital system was observed in terms of its regional structure, hospital statistics, types of hospitals, hospital financing, and design and construction. Hospital administration and staffing, specific hospital services, maternity and child care services, polyclinic services, emergency services, and research institutes were also observed and analyzed. Appendices to the study report provide detailed information on selected interviews and visits and individuals met by the delegation.

HRP-0007061/5GA PC$3.50/MF$3.00
Public Health Service, Washington, D.C. Architectural, Engineering, and Equipment Branch.
Effects of Glazing and Building Orientation on Hospital Air-Conditioning Costs.
Kenneth L. Credle. Feb 66, 15p

Descriptors: Revisions, *Health care technology, Health care facilities, Design, Construction.

Consideration is given to the effects of glazing and building orientation on hospital air conditioning costs. It is noted that the choice of exterior wall material for hospitals, whether it be glass, masonry, or any desired combination of these, and the choice of wall orientation and hospital configuration are the prerogatives of hospital planning boards and their architects. One of the thermodynamic principles to be followed involves heat flow through an exterior wall because of the difference in temperature on opposite sides of the wall. Another thermodynamic principle which must be followed relates to heat gain caused by exposure to sun. Design conditions and assumptions in evaluating the effects of glazing and building orientation on hospital air conditioning costs are reviewed. Per-square-foot cost charts are provided and the chart values are applied to a typical hospital. If glass is to be used extensively as an outside wall material for a hospital, it is recommended that consideration be given to building orientation and to the use of shading devices or heat absorbent types of glass. A bibliography is provided.

HRP-0007063/1GA PC$4.00/MF$3.00
Public Health Service, Bethesda, Md. Architectural, Engineering, and Equipment Branch.
Fallout Protection for Hospitals.
Mar 68, 36p

Descriptors: Revisions, Medical equipment, *Health care technology, Health care facilities, Health care costs, Design.

The practical application of hospital fallout shelter guidelines to the design of a prototype hospital is discussed. The U.S. Public Health Service collaborated with the Office of Civil Defense to develop general criteria and standards for protective measures in hospital. This collaboration effort resulted in technical requirements for fallout shelters in hospitals. A hospital in the 150 to 200 bed capacity range was selected for study in applying fallout shelter guidelines. The following broad guidelines were established to assist in project development: (1) the hospital should be well-designed in accordance with current functional planning and design criteria; (2) protective measures should be incorporated in the design in a manner that will not detract from normal functions; (3) consideration should be given to the maximum utilization for shelter of available hospital services and spaces; (4) the design should meet national building code and regulatory requirements; (5) protective features of the resulting design should be readily apparent although not in a disquisting fashion; and (6) the design should be as modern and attractive as possible. Application of these guidelines to the study hospital was examined in relation to the hospital plan, shelter space, electrical power, mechanical systems (plumbing, water supply, heating, air conditioning and ventilation, refuse and garbage disposal, and fire protection), cost of protection for the prototype hospital, protected addition to an existing hospital, and natural disasters. An appendix to the report provided the technical requirements for hospital fallout shelters, as developed by the U.S. Public Health Service.

HRP-0007066/4GA PC$5.00/MF$3.00
Health Facilities Planning and Construction Service, Silver Spring, Md.
Environmental Aspects of the Hospital. Volume I: Infection Control.
Mar 70, 77p
Volumes II and III are available as HRP-0004580 and HRP-0007065 respectively.

Descriptors: *Sanitation, Safety hazards, Occupational safety and health, Health care facilities, Environmental health.

The first in a series of reports being produced to provide guidelines for the development of environmental control programs in modern hospitals is discussed. Special attention is given to major considerations for each hospital department head in carrying out his part of such programs. An effort has been made to present a synthesis of principles and practices derived from successful past environmental control programs in hospitals. The Committee on Environmental Engineering Aspects of Hospitals and Medical Care Institutions served as the review and advisory group on the content of the environmental control program series. The first report in the series outlines the history and present status of the modern hospital both as a health center within the community and as a clinical setting for the practice of medical specialties. The principles of bacteriology and epidemiology are presented as additional background for a discussion of infection control procedures and basic considerations in the decontamination and sterilization of equipment, supplies, and the general environment. Subsequent publications in the series will deal with supportive departments of a hospital, safety programs, and administrative aspects of environmental control. Supporting tabular data on environmental control are included, along with two appendices which provide information on cleaning, disinfection and sterilization, and recommendations for chemical disinfection of medical and surgical materials.

HRP-0007068/0GA Not available NTIS
Health Care Facilities Service, Rockville, Md.
Patient Education Leads to Better Care for Heart Patients.
Stanley G. Rosenberg. 1971, 10p DHEW/HSm-73/4029
Pub. in Health Services and Mental Health Administration Reports v86 n9 p793-802 Sep 71.

Descriptors: State regions, Reviewing, Research, Preventive medicine, Patients, New Jersey, Methodology, *Health education, Health care, Health care services, Health care delivery, Feasibility studies, Evaluation, Education, Consumers, Comments, Assessments.

A project initiated by the New Jersey State Department of Health in 1964 to examine the effectiveness of patient education in terms of better care for heart patients is described. The project was undertaken at St. Peter's General Hospital in New Brunswick, New Jersey from 1964 to 1966. Project plans called for a multidisciplinary team of hospital, community agency, and State agency personnel who could provide services organized around the existing cardiac clinic of a hospital. The project had three major objectives: (1) to provide comprehensive care to congestive heart failure patients with quality services in medicine, nursing, diet, health education, and social aid; (2) to evaluate the usefulness of a comprehensive multidisciplinary team approach utilizing planned and coordinated education for the patient and his family, to halt or delay progression of the congestive heart failure syndrome; and (3) to serve as a demonstration project. Study results showed that an education program for 50 patients with congestive heart failure increased patients' knowledge regarding their disease, medication, and diet as well as their adherence to a prescribed regimen. When compared with previous experiences of the study group and with the experiences of a control group of patients, readmissions and total readmission days were significantly reduced for the project participants. Supporting data are included.

HRP-0007067/0GA PC$5.00/MF$3.00
National Inst. of Mental Health, Rockville, Md.
Typological Approach to Doing Social Area Analysis.
Harold F. Goldsmith, Elizabeth L. Unger, Beatrice M. Rosen, Charles D. Windle, and J. Philip Shambaugh. 1975, 78p DHEW/ADM-76/262

Descriptors: Vital statistics, United States, Minority groups, Methodology, Health status indexes, Health care, Health care indexes, Demography, Data processing, Data analysis, Communities.

A manual is presented to assist mental health and health planners at State and local levels to use the Mental Health Demographic Profile System (MHDPS) in the analysis of the residential areas for which they are responsible for providing services. The MHDPS was developed as a small-area data profile system by the National Institute of Mental Health to facilitate community planning. The 130 demo-

graphic data items (social indicators) and the age-sex pyramids from the 1970 Population Census were selected to delineate meaningful social areas (residential areas with common social rank, life style, ethnicity, and other related characteristics), and subsequently to make inferences about the health and related needs of the resident populations of those areas. The system contains indicators of the major components of the social rank dimension -- economic status, social status, and educational status. Components of the life style dimension are also indexed using indicators of family status, family life cycle state, residential life style, and familism. Also provided are indicators of ethnicity, community stability, area homogeneity, and populations with high risk of social problems. The manual includes self-teaching materials showing how to use the indicators to perform a social area analysis, applying mainly to homogenous areas; a guide to complex social area analysis; and two social area profiles used as illustrations. Portions of this document are not fully legible.

HRP-0007097/9GA Not available NTIS
Veterans Administration Hospital, Shreveport, La.
Effective Management Is No Accident.
Louis M. Frazier. 1972, 4p
Pub. in Hospital Topics v50 n9 p50-53 Sep 72.

Descriptors: Quality assurance, Personnel management, Methodology, Measurement, Health planning, Health occupations, Health care, Agencies.

Key factors in effective hospital management are addressed. One objective in the development of effective hospital management is to be aware of how patient care is affected by utilizing management engineering skills and techniques. Since effectiveness is quality and quality is an intangible that is difficult to measure, there is no one special or workable formula for insuring effective hospital management. People determine efficiency and effectiveness; efficiency is the means to an end while effectiveness is the result. This differentiation is important to managers and especially to management engineers and management analysts who advise managers. The necessary characteristics of management personnel are discussed, along with their responsibilities. The need for adaptation to and not adoption of new ideas, methods, procedures, and techniques in hospital management is stressed. It is concluded that the key to effective management involves balance in an operation. Effective hospital management must focus on patients, since procedures, methods, tools, and practices are designed to expedite, simplify, and ease the delivery of care to patients. Hospital management and acceptable patient care delivery are considered to be synonymous in hospital operation.

HRP-0007104/3GA Not available NTIS
South Okanagan Mental Health Center, Kelowna (British Columbia).
Utilization of Public Health Nurses as Agents of Behavioral Change in the Community.
Keith E. Barnes. 1972, 3p
This paper was presented to the Child Mental Health Section, at the Annual Meeting of the American Public Health Association, in Atlantic City, New Jersey, on November 15, 1972.
Pub. in the American Jnl. of Public Health v65 p1099-1101 Oct 75.

Descriptors: *Public health, *Nurses, Health occupations, Health manpower, Health education, Health care utilization, Health care services.

The possible expansion of the role of the public health nurse to include observation and treatment of preschool behavior problems is discussed. It is noted that, in paying regular visits to the ever-increasing numbers of preschool facilities (day care centers, cooperative kindergartens, nursery schools, etc.), the public health nurse is in a position to observe preschoolers in social interaction with each other, to observe how they respond in initial attempts at learning outside of their homes, and to serve as a consultant and counselor to parents, preschool teachers, and day care center workers. It is suggested that the public health nurse assume the responsibility and initiative in rectifying early behavior problems which, if left unattended, may erupt into serious problems as the child enters into the primary school system. If public health nurses lack specific training in areas of behavior modification, social learning, and child management, training opportunities could be developed in local mental health centers. The essence of the suggested extended role is twofold: (1) public health nurses can provide an objective role model, particularly for mothers, in such areas as observation child behavior, application of social learning techniques, and fundamentals of behavior modification and behavioral management; and (2) public health nurses can fill the role of primary contact professional, acting as a referral agent for serious behavior problems and as consultant or treatment worker in secondary prevention situations. The expanded role is discussed in the context of a team approach, with preschool teachers, day care centers workers, and parents as the other members of the team. A bibliography is included.

HRP-0007105/0GA Not available NTIS
Missouri Univ., Columbia. School of Medicine.
Nursing Is Coming of Age Through the Practitioner Movement.
Ingeborg G. Mauksch, and Martha E. Rogers.
1975, 10p
Pub. in American Jnl. of Nursing v75 p1834-1843 Oct 75.

Descriptors: Registered nurses, *Nurses, *Health resources, Health occupations, Health manpower, Health care utilization.

Views for and against the concept of the nurse practitioner are presented by a professor and family nurse practitioner in the Department of Community Health and Medical Practice, School of Medicine, University of Missouri, and by a nurse-scientist, who is a professor and former head of the Division of Nursing at New York University. The former views the nurse practitioner as possessing different characteristics, behaving differently, and practicing differently from the traditional nurse. The nurse practitioner applies the nursing process, is accountable to herself and to the consumer of her sevices, behaves as a decision-maker and risk-taker, and delivers care interdependently with other health professionals. The nursing practitioner proponent welcomes this concept of 'action' practice, and examines the advent of the nurse practitioner from the vantage point of certain portents of societal change, including women's liberation, assertiveness, egalitarianism, and 'humanness.' The proponent concludes that the nature of the nurse practitioner may be nursing's means of survival as well as one answer to society's quest for better health care. The opposing viewpoint recognizes the need for both professional and technical nurses as well as the respectability and value of both. It is suggested that, although there are nearly three times as many physicians as there are professionally educated nurses, medicine is striving to diminish nursing's numbers by forcing nurses to practice instead at a 'lower level in medicine, ' i.e., the nurse practitioner, physicians' assistant, primary care practitioner, etc. These designations are described as providing 'succor and profit for the nation's shamans.' Ways in which individuals might develop within more traditional nursing roles are suggested, as is the nature of nursing's contribution to improvement of health care.

HRP-0007150/6GA Not available NTIS
Camden County Senior Citizens Day Care Center, Lakeland, N.J.
Walking Version of ECF.
Barry Feldscher. 1974, 4p
Pub. in Hospitals, Jnl. of the American Hospital Association v49 n5 p75-77, 80 1 Mar 75.

Descriptors: Strategy, State regions, New Jersey, Methodology, Health planning, *Health care services, Ambulatory health care.

A day care center is described that was instituted for senior citizens in Camden, New Jersey. The purpose of the center was to increase the ability of senior citizens to care for themselves and to encourage independent living and social self-sufficiency by providing medical, psychiatric, and social supportive services. The day care center was established in the Skilled Nursing and Intermediate Care Facility of Camden County Hospital. Procedures to be followed in the establishment of a day care facility are outlined in relation to requirements for participant acceptance, communication during the facility's operation, space requirements, financing (donations), transportation, recordkeeping, and motivation. Types of positions that may be needed in a day care center for the elderly include an administrator, social worker, occupational therapist, recreational therapist, and miscellaneous positions (art teacher, specialized therapist, cook, secretary, nurse, physician consultant, and paraprofessional aids). Recordkeeping involves the processing of applications, medical histories, releases, attendance records, financial information (collections and expenditures), supply inventories, and activities completed at the center. It is concluded that, under the auspices of a county hospital's extended care facility, a day care center can provide adequate medical, social, and psychiatric support for senior citizens.

HRP-0007172/9GA Not available NTIS
California Univ., Los Angeles. Neuropsychiatric Inst.
Cost-Efficiency of Mental Health Delivery Systems: A Review of the Literature on Hospital Care.
Philip R. May. 1969, 8p
Pub. in American Jnl. of Public Health, v60 n11 p2060-67 Nov 70.

Descriptors: Standards, Reviewing, Rates(Costs), *Mental health care, Indexes(Ratios), Health care, Health care requirements, Health care indexes, *Health care costs, Evaluation, Demography, Criteria, Communities, Assessments.

Rising costs and the increasing demand for psychiatric services are discussed in relation to manpower utilization problems and cost efficiency in the delivery of mental health care. A number of studies are reviewed which provide information on medical care research, custodial versus intensive care, and costs of psychiatric services by diagnostic category. It is felt that increasing costs along with the demand for psychiatric services are likely to focus attention on problems of manpower utilization and cost-effectiveness in mental health care delivery systems. In the past, the cost of psychiatric hospital care has traditionally been expressed as a per diem rate based on average resident population. Such rates are inappropriate for cost-effectiveness comparisons and may seriously mislead more responsible program planning and patient treatment. Cost per case treated is considered to be a more meaningful index of cost efficiency. The literature review demonstrates that there is a significant need for more scientific investigation in this area and for controlled studies that will provide objective financial outcome data. In particular, there is a lack of controlled research on the comparative costs of various treatment methods used for schizophrenic patients.

HRP-0007177/9GA Not available NTIS
Minnesota Univ., Minneapolis.
Academic Health Center - On the Rocks with a Twist of Dilemma.
Robert B. Howard. 1970, 8p
This paper is the text of Chairman's Address as prepared for delivery October 30, 1970, at the 81st Annual Meeting of the Association of American Medical Colleges, Los Angeles, California.
Pub. in Medical Education v45 n11 p839-848 Nov 70.

Descriptors: Universities, Schools, Medical education, Medical centers, Health science centers, *Health resources, Health related organizations, Health manpower education, Health education, Health care facilities.

The academic health center concept is examined by the 1969-70 chairman of the Association of American Medical Colleges. The lack of a defined health care delivery system is considered to be the major dilemma facing American medicine. Many dilemmas of the academic center relate to its proper functioning within an overall health care delivery system. It is emphasized that no foreseeable increase in the production of physicians will solve the health care dilemma in the U.S. Instead, it is necessary to establish a health care delivery system that effectively utilizes all available health care personnel and facilities. It is noted that academic health centers are involved in a wide variety of activities and functions, and that the term medical school should not be used to embrace the academic health center as a whole. Inclusion of the word 'academic' should effectively convey the educational and research functions of academic health centers, while 'health center' should indicate that these institutions also render health care. In a discussion of the service function of the academic health center, it is noted that the center's research function requires that it be involved in service. It is recommended that the academic health center be regarded as an integral part of an emerging health care system and that it receive financial support appropriate to such a function.

HRP-0007180/3GA Not available NTIS
California Univ., Davis. School of Medicine.
Curriculum Effects on New Medical School Planning.
R. F. Walters, T. C. West, L. D. Carlson, and H. S. Davis. 1970, 14p
Pub. in Jnl. of Medical Education v45 n11 p866-879 Nov 70.

Descriptors: Universities, State regions, Schools, Medical education, Health resources, Health related organizations, *Health manpower education, Health education, Curricula, California.

Events and decisions that led to the creation of a medical school on the University of California's Davis campus are summarized. Emphasis is placed on the curriculum design process and its effect on decision-making. Initial planning efforts for the Davis School of Medicine included coordination with existing faculties and recruitment of key administrators. A representative group of faculty addressed the initial design of a curriculum. A two-day conference was scheduled to define a curriculum based on the following principles: (1) the curriculum would employ the core concept; (2) the student would be allowed sufficient free time to supplement core material through self-study and electives; (3) the fourth year of study would be devoted entirely to electives; and (4) instruction throughout the presentation of core material would be interdisciplinary, with emphasis on the integration of faculty resources as well as basic and clinical subject material. The Office of Medical Education was established within the school of medicine, and general requirements for student admission were established. It was determined that curriculum planning can affect the construction of educational facilities in two basic ways: by a priori definition of the method of teaching; and through the use of test facilities within which both curriculum and construction concepts are investigated prior to the construction of permanent facilities.

HRP-0007194/4GA Not available NTIS
California Univ., Berkeley. School of Public Health.
Consumer as Policy-Maker-Issues of Training.
Alberta W. Parker. 1970, 15p
This paper was presented before the Public Health Education Section of the American Public Health Association at the 97th Annual Meeting in Philadelphia, Pa., November 11, 1969.
Pub. in American Jnl. of Public Health v60 n11 p2139-2153 Nov 70.

Descriptors: Participative management, Methodology, Management, Local government, Health planning, *Health education, *Consumers, Community relations, California, Agencies.

The training needed and desired by consumers serving on policy-making boards of neighborhood health centers is discussed in the context of a 1968-69 demonstration project by the Berkeley Consumer Health Project in California. These consumers are primarily representatives of low income groups and participants in the study were members of boards of neighborhood health centers in three very different communities. One community was a typical black urban ghetto and all board members were from the community; another was a unique suburban ghetto and all but two members came from the community. The third community was a semirural, nonfarm, Spanish-speaking community, all of whose members were eligible for services. During the project's organizational phase, staff and board members became acquainted and informed on community issues. A joint planning session was held with all three boards to develop a training program. Workshops were planned for the three groups together, but the language barrier was too vast and the Alviso group met separately. While topics were chosen, the workshops developed a life of their own and went in diverse directions. The group desired a longer training period and requested payment for training. The major problems discussed were: the board's internal relationship, the board's relationship with professional staff, the board's relationship to the larger health care system, the board's relationship with the community, the board's relationship with the funding agency, and relationships of the board member to himself.

HRP-0007206/9GA Not available NTIS
Rush-Presbyterian-St. Luke's Medical Center, Chicago, Ill.
Hospital Setting and Patient Care Outcomes.
Sue Thomas Hegyvary, and Patricia Ann Chamings. 1974, 4p
Grant PHS-NU-27291
Pub. in Jnl. of Nursing Administration v5 n3 p29-32 Mar-Apr 75.

Descriptors: Research, Quality assurance, Patients, Methodology, Measurement, Health care, *Health care services, Health care delivery.

The methodology employed in a study of the effects of preoperative stress, of the provision of preoperative instructions, and of the hospital setting on postoperative outcomes is documented. A total of 91 patients undergoing abdominal hysterectomy in two hospitals participated in the study. To measure the effect of preoperative instructions, one group of patients received oral instructions and a second group received the same instructions in written format; in both sets of instructions, special emphasis was placed on measures to prevent respiratory and circulatory complications. Each patient in the study was interviewed on the afternoon before the operation to ascertain social data and to determine the level of stress. Five postoperative outcomes selected as dependent variables were: incidence of nausea and vomiting, number of doses of narcotics received, number of days to return to a solid diet, incidence of complications, and length of postoperative hospitalization. A sixth variable, the patient's level of understanding of care and expectations, was measured on the fourth postoperative day and was analyzed both as an outcome measure and as an independent variable having possible effects on other outcome measures. Study findings, which are presented in a separate, subsequent article, indicate that the hospital setting was the only consistently significant variable. The scale used for measurement of preoperative stress level and an outline of preoperative instructions are included.

HRP-0007261/1GA Not available NTIS
Houston Univ., Tex. Coll. of Business Administration.
Prices and Profits in the Drug Industry: An Economist's View.
Henry Steele. 1970, 14p
This article is taken from the author's testimony given before the U.S. Senate Committee on Small Business on January 19, 1968.
Pub. in the New Physician v20 n3 p146-159 Mar 71.

Descriptors: *Health economics, Health care costs, Economics, Economic studies.

Drug industry problems in the United States are discussed from an economist's point of view. Market characteristics of the drug industry may bias that industry in the direction of inefficient and noncompetitive performance in five major respects: (1) essential to the effective operation of a free market is the ability of a buyer to choose among suppliers on the basis of an adequate knowledge of the price and quality of alternative products available, an opportunity not existing in the drug market; (2) the price - conscious buyer should be able to identify the lowest priced seller and purchase from him without artificial impediments, an opportunity denied the consumer of prescription drugs; (3) there must be freedom of entry into the industry by new firms, lessened in the drug industry by patent privilege, the trademark device, and the necessity for newcomers to match advertising outlays of existing rivals; (4) there should be an adequately large number of competitive sellers offering buyers genuine alternatives in terms of product price and quality, which is not the situation in the drug industry; and (5) a market is not workably competitive unless all firms act independently, a practice hindered in the drug industry by price leadership and patent practices. A cost analysis is presented of factors influencing the supply of prescription drugs, including basic research, applied research, product development, manufacturing the active ingredient, preparation of finished dosage forms, and sales promotion. Similarly, factors influencing the demand for prescription drugs are examined, and directions for public policy with regard to prescription drugs are suggested. It is noted that a solution to the problem of high drug prices must await the adoption of a series of reforms which will alter marketing and prescribing practices and bring about price competition at both manufacturing and retail levels.

HRP-0007266/9GA Not available NTIS
California Univ., Los Angeles. School of Public Health.

Health Information Systems: The Wave of the Future or a Wave at the Past.
Paul Torrens. 1974, 5p
Pub. in Medical Record News v46 n1 p10, 12-15 Feb 75.

Descriptors: Methodology, *Medical records, *Information systems, Health care, Data processing, Data processing systems.

The dimensions and role of health information systems of the future are discussed in the context of improving quality by providing information which is necessary for decision-making in advance of the need. In contrast to present systems, which are historical and archival in nature, the health information systems of the future will be built around three central issues: cost containment, discontinuity of the American life style, and consumer involvement. They will collect health care information and financial information into one record system that will provide information in advance on the costs and effectiveness of certain modes of treatment and the existence of alternative treatments. It is suggested that it will be necessary to develop systems which bring cost and patient care items back together, which are patient-based, not institution-based, which enable health care providers to make adequate judgments about the quality of care provided, and which help to educate and motivate the patient to take better care of himself and his family. It is further suggested that today's medical record practitioner must become the planner, the educator, and the initiator of the future.

HRP-0007268/6GA Not available NTIS
New York City Health and Hospital Corp.
Some Comparative Costs in Comprehensive Versus Fragmented Pediatric Care.
Margaret C. Heagarty, Leon S. Robertson, John Kosa, and Joel J. Alpert. 1970, 8p
Pub. in Pediatrics v46 n4 p596-603 Oct 70.

Descriptors: Utilization, State regions, Reviewing, Research, Methodology, Massachusetts, Health care, Health care facilities, *Health care delivery, *Health care costs, Feasibility studies, Evaluation, Emergency medical services, Comments, Assessments, Ambulatory health care.

Laboratory study and related costs in a comprehensive pediatric care program are compared with those of an emergency clinic providing fragmented care to control groups. In 1964, 750 families in a Boston emergency clinic were randomly assigned to three groups. A total of 250 families in an experimental group were offered comprehensive pediatric care in a family health care program. Two control groups, each also containing 250 families, continued to obtain care in their usual way in well baby clinics, emergency clinics, specialty clinics, and occasionally private physician offices. A three-year research program was undertaken to compare these groups in terms of service utilization, morbidity, attitude toward medical care, and cost. It is noted that studies on the costs of medical care often concentrate on such factors as capital and personnel expenditures but ignore costs of such items as laboratory studies which are a major factor in direct cost to the patient. Laboratory studies are less often performed and thus cost less in a comprehensive health care program than in a fragmented program. These differences can be attributed to greater knowledge of patients in the comprehensive program and different modes of teaching in comprehensive versus fragmented environments. It is concluded that alternatives to the current trend toward primary medical care being delivered in hospital emergency rooms should be investigated.

HRP-0007270/2GA Not available NTIS
Letterman Army Medical Center, San Francisco, Calif.
Hemodialysis in the Home.
Richard E. Chojnacki, and Kathleen Keady. 1974, 5p
Pub. in American Family Physician v11 n2 p149-153 Feb 75.

Descriptors: Therapy, State regions, Patients, Health education, Health care technology, Health care services, Education, Consumers, California.

A discussion is presented on the requirements, benefits, and problems of home hemodialysis, based on the experience of the home hemodialysis program at Letterman Army Medical Center in San Francisco, California. Home hemodialysis is based on three general principles: (1) chronic illness is better treated at home than in the hospital; (2) the more responsible the patient is for his own care, the better the results will be; and (3) the more informed the patient is about details and complications, the better able he is to provide his own care. At Letterman, the training program provides six to eight weeks of instruction in all areas of hemodialysis for the patient and for a helper, usually the patient's spouse; the training sessions are conducted in a simulated home atmosphere. Specific areas of instruction include monitoring and interpretation of vital signs; assembly of dialyzer; operation, maintenance, and repair of dialysate delivery system; composition and function of dialysate; performance of self-venipuncture; management of complications; medical aspects of chronic renal failure and maintenance hemodialysis; fluid and electrolyte balance; interpretation of laboratory tests; diet; medications; home planning; and ordering and maintaining supplies. Criteria used in selecting trainees for home dialysis are noted, and reasons behind the failure of 20 percent of those selected to complete their training are pointed out.

HRP-0007279/3GA Not available NTIS
Kentucky Univ., Lexington. Medical Center.
Nurse - Physician Teamwork.
Barbara Bates. 1965, 12p
Pub. in Medical Care v4 n2 p69-80 Apr-Jun 65.

Descriptors: Specialists, Registered nurses, *Physicians, *Nurses, Health occupations, Health manpower, *Health care utilization.

The elements which comprise nurse - physician teamwork for patient care are defined using specific examples of physician behavior which help or hinder nursing care. Critical incidents concerning patient care were collected from 115 registered nurses in a 250-bed university teaching hospital. Of the 836 incidents collected, 43.4 percent describe helping actions and 56.6 percent describe hindering actions. Thirty-one percent of the incidents describe communication by the physician with the nurse, and about one-third of these communication incidents relate to order writing. Coordination of physician - nurse activities comprises six percent of the incidents described and cooperation with the nurse describes five percent. Seven percent of the incidents describe the physician as he recognizes and conserves limited nursing resources. Effectiveness in working with other physicians and medical students is mentioned in three percent of the incidents. Using the same methodology, 514 incidents concerning physician perceptions of nurse behavior which help or hinder medical care were collected. The general categories of incidents collected are: (1) providing the physician with assistance in patient care (20 percent); (2) following the physician's orders (27 percent); (3) effective communication with physician (20 percent); (4) effective performance in her own role (25 percent); and (5) willingness to deviate from institutional policies (two percent). Specific examples are used to illustrate each type of physician or nurse behavior.

HRP-0007282/7GA PC$3.50
Community Emergency Care, Inc., San Francisco, Calif.
Bay Area Emergency Medical Care Coordination Project.
Final Rept.
Oct 75, 24p

Descriptors: State regions, State government, *RMP(Regional Medical Programs), *Regional medical programs, Plans, Health resources, Health related organizations, Health planning, Health care utilization, Health care services, *Health care delivery, Grants, Financial management, *Emergency medical services, Development, California, Agencies.

An emergency medical services coordination project funded by the California Regional Medical Program is reported. The project objective was to upgrade and coordinate emergency medical services in nine Bay Area counties, focusing on the areas of training, public education, evaluation, and communication. A series of workshops and conferences addressing these components of an emergency medical services system was held, involving appropriate representation from the nine counties. Additional activities were directed toward information exchange and technical assistance, including the development of resource files, publication of a newsletter, and the sponsorship of an emergency medical services forum. The forum was an open membership organization addressing issues pertaining to regional coordination of emergency medical services. Community Emergency Care, Inc. also joined with other health agencies in the Bay Area in the development of a regional emergency medical services council and in the development of regional program plans and a grant proposal funded by DHEW in July, 1975. The results of these efforts have been increased awareness and support of emergency medical services, acknowledgement of the role played by regional services coordination, and a formalized mechanism for the development of a regional emergency medical services system. Portions of this document are not fully legible.

HRP-0007288/4GA Not available NTIS
Vanderbilt Univ., Nashville, Tenn. School of Medicine.
Death and Dying: A Course for Medical Students.
David Barton, John M. Flexner, Jan Van Eys, and Charles E. Scott. 1972, 7p
Pub. in the Jnl. of Medical Education v47 n12 p945-951 Dec 72.

Descriptors: Health manpower education, Health education, Curricula.

The format, content, and goals of an elective course designed to teach medical students about the psychosocial aspects of life-threatening illness are described. The course was designed to fulfill the following instructional goals: (1) facilitate gradual desensitization to death and dying through group interaction and discussion; (2) focus student attention on important psychological and sociocultural issues involved; (3) present and discuss with students the perspectives of medical personnel and others who are involved in providing care for patients with life-threatening illness; and (4) encourage acthe consideration and discussion of ethical issues. The course, a semester in length, was held each week and was conducted by a psychiatrist, a hematologist, a pediatric hematologist, and a professor of philosophy. The size of the class was limited to insure extensive group discussion. To accomplish the instructional goals, a format combining a number of local presentations such as patient interviews, selections from the literature, and dialogue with care-giving personnel was utilized along with extensive group discussion. Using this format, students were aided in beginning to synthesize

their own feelings about death and dying, thereby better attending to the numerous individualized needs of patients with life-threatening illness.

HRP-0007298/3GA PC$4.00/MF$3.00
Community Health Service, Rockville, Md.
Guide for Promoting Home Health Services.
Jan 73, 26p DHEW/HSM-73/6406

Descriptors: United States, State government, Participative management, Methodology, Management, Local government, Health resources, Health related organizations, Health planning, *Health education, Government agencies, Consumers, Community relations, Agencies.

Guidelines for the promotion of home health agencies are presented. An effective program to promote home health care must include two principal functions: (1) development and preparation of materials for use by the mass media, free lance writers, columnists, and numerous specialized publications and magazines within a community; and (2) development and preparation of materials other than those prepared especially for mass circulation media, including brochures, booklets, flyers, audiovisual materials, and graphics which help to build general community awareness. Assistance and expertise to support home health agencies may come from local, State, and national professional associations; key health individuals; educational facilities; government and related groups; and community organizations. Procedures are outlined for establishing a home health agency, with emphasis on the organization of a home health promotion committee, materials and resources necessary for a promotion program, and the preparation and development of public information materials.

HRP-0007304/9GA PC$3.50/MF$3.00
Rhode Island Health Services Research, Inc., Providence.
Determinants of Dental Utilization: Implications for Financing Programs.
Owen Thornberry, Ann Walker, H. Denman Scott, and Joseph A. Yacovone. 1973, 24p
Grant PHS-HS-00720

Descriptors: Surveys, *Rhode Island, Methodology, Measurement, Health care, *Health care utilization, Health care services, *Dental services, Data collection, Data acquisition.

Data are presented on the utilization of dental services and hospitalization for dental problems for a population of approximately one million in the State of Rhode Island. Hospitalization data were obtained from the Uniform Hospital Discharge Data Demonstration Project, in which 13 of 14 general hospitals in Rhode Island were participants. Selected information was abstracted for all discharges (117,996) from the participating hospitals during 1972. Dental utilization data were obtained through a statewide household survey conducted by Rhode Island Health Services Research, Inc., during the early part of 1972. The sample was a full probability sample, with households randomly selected from within each of Rhode Island's 39 cities and towns. Interviews were obtained for 93 percent of the families in the sample. Information on disability and utilization of health services was obtained for 3,066 families consisting of 9,383 individuals or approximately one percent of the population of Rhode Island. The percentage of the population with at least one dental contact in the past 12 months was used as an indicator of entry into the dental care system and as a measure of the extent of dental utilization among the population. The mean number of visits per year reflected the total volume of visits in terms of the population served. The mean number of visits per year was calculated only for persons who had seen a dentist within the past year. This figure indicated the volume of dental use by those with entry into the dental care system. The results of this study are presented in tabular form.

HRP-0007320/5GA Not available NTIS
British Columbia Univ., Vancouver.
Medical Student Change During a Psychiatry Clerkship: Evaluation of a Program.
William L. Maurice, Harry Klonoff, James E. Miles, and Robert Krell. 1975, 9p
Pub. in the Jnl. of Medical Education v50 n2 p181-189 Feb 75.

Descriptors: Universities, Schools, Mental health care, Medical education, Health resources, Health related organizations, Health manpower, *Health manpower education, Health education, Health care services, Foreign countries.

The student ward model approach to teaching clinical psychiatry is evaluated. The psychiatry clerkship at the University of British Columbia emphasizes the teaching model of the student as primary therapist. In the adult program, this takes the form of a ward in which clinical clerks are the primary medical agents. In the child program, each clerk accesses and treats a new family referral. The student ward model approach was evaluated using fourth-year medical students who began and completed their psychiatry clerkship at the university between January and September, 1973. A total of 31 students were included in the study. Student knowledge, attitudes, personality attributes, and expectations were assessed at the beginning and end of an eight-week rotation period, and changes were noted. Principal findings included significant differences in the following: psychiatric knowledge, attitudes about psychiatric illness, ratings of students by the psychiatrist supervisor, and some student personality characteristics. It is noted that most students had rotation experiences which went beyond prior expectations. The changes which did occur were considered to be important although modest. The implications of these changes are discussed, and it is noted that the level of patient care in the study programs compared favorably with similar situations in which residents are primary therapists.

HRP-0007322/1GA Not available NTIS
Management of the Team in General Practice.
Mary Boothroyd Brooks. 1973, 14p
Pub. in Jnl. of the Royal College of General Practitioners v23 p239-252 1973.

Descriptors: Specialists, Registered nurses, Physicians, Organization theory, Nurses, Job analysis, Health resources, Health related organizations, Health occupations, Health manpower, Health care services, Foreign countries.

A study is reported which examined the need for role definition, the problem of leadership and authority, the importance of adequate communication, and the necessity for agreement regarding goals and priorities in general practice team management. Seven general practice teams were investigated; each team consisted of two or three general practitioners, an attached home nurse, midwife, health visitor, and social worker from the mental health division of the local health authority. The study was exploratory and attempted to investigate problems of role definition, authority and decision-making, and patterns of communication within the study teams in a northern city in England. Each worker was interviewed separately using an interview guide which insured that certain topics were covered. In general, the workers saw themselves to be concerned with a wider variety of cases than the other team members attributed to them. Physicians were generally perceived as the team leader. A team meeting approach to communication was regarded by the majority of workers as satisfactory. The interview of workers did not include specific questions on goals and priorities. It was recommended that general practice team management be evaluated in terms of effectiveness, accessibility, technical competence, and personal care.

HRP-0007323/9GA Not available NTIS
Group Dynamics and the Domiciliary Health Team.
D. L. Crombie. 1970, 13p
Pub. in Jnl. of the Royal College of General Practitioners v19 p66-76 Apr 70.

Descriptors: Sociology, Socioeconomic status, Socioeconomic factors, Health occupations, *Health manpower, Health care, Demography, Communities.

The role of the health team and the roles of the members of the health team are examined in regard to group dynamics. It is felt that the quality of human life is directly related to the relative value placed on the individual as an individual within the demands of his group system. It is a paradox of human existence that the personal ethic of 'love thy neighbor' has evaded incorporation in the formal structure of any society which has achieved political success and cultural stability. There are mechanisms within the formal sociological system which can be invoked to indirectly maintain and support a healthy bias toward the individual. Among these mechanisms are unitary personal advisors of whom the physician remains a prime example with his clearly defined and unshared personal role. Improvements in the activities of the sociological group system should be directed toward increased efficiency; however, increased efficiency should not be obtained at the expense of an ever-increasing complexity of the network of human relationships with which each individual must be involved. A reduction in the number of agencies and individuals with which a person need be involved, a reduction in the degree of fragmentation of any aspect in one's social life, and a constant attempt to stabilize human relationships for the greatest possible length should be complementary aims to a simple increase in technical efficiency.

HRP-0007334/8GA Not available NTIS
Watts Hospital, Durham, N.C. Dept. of Surgery.
Day Surgery: A Viable Alternative.
James E. Davis. 1973, 7p
Pub. in the Association of Operating Room Nurses v19 n3 Mar 74.

Descriptors: State regions, Organization theory, North Carolina, Health resources, Health related organizations, Health care utilization, Health care services, Health care facilities, *Ambulatory health care.

Day surgery is discussed as a viable alternative to hospitalization. Surgery without overnight hospital stay is known as ambulatory surgery, short-stay surgery, in-and-out surgery, outpatient surgery, day surgery, and drive-in surgery in various parts of the U.S. This type of surgery can be defined as surgery of an uncomplicated nature which customarily has been done on an inpatient basis but which can be done equally as effectively on an outpatient basis. It is noted that most one-day surgical cases are of a gynecological, otolaryngological, or general surgical nature. Three different physical arrangements for one-day surgery are in use: (1) special wards for admission, preoperative evaluation, and postoperative care; (2) rooms for preoperative and postoperative care and (3) autonomous units which have their own operat-

ing room as well as space for preoperative and postoperative care. The use of one-day surgery at Watts Hospital in Durham, North Carolina is discussed in terms of the impact of such surgery on operating rooms, nursing and administrative staff, anesthesia staff, and surgical and surgical resident staff. It is concluded that one-day surgery is safe and economical as an alternative to hospitalization and that the impact of such surgery is to increase markedly the workload of operating rooms, recovery rooms, and departments of anesthesia.

HRP-0007341/1GA PC$3.50/MF$3.00
California Univ., Los Angeles. School of Public Health.
Quick Reference Outline of Recent Evaluation Work.
Ellen B. Gold. 1974, 13p
Grant PHS-MH-22761

Descriptors: Standards, Reviewing, Health care, *Evaluation, Criteria, Assessments.

A schematic review of 25 recent works written about evaluation research is presented. The review presents, in tabular form, major areas of concern relevant to the evaluation field. Elements included in the review chart are: background, definition, and purpose of evaluation; issues and problems in evaluative research; evaluation resources; funding and staff; administration of evaluation studies; formulation of goals and measurement of outcome; evaluation design and methodology; practical implications of evaluation research; use of research findings; implications for training in social research; programs and evaluations in health and mental health; and programs and evaluations for social and economic problems. An overview of several major works in the evaluative research area is included.

HRP-0007352/8GA PC$3.50/MF$3.00
American Medical Association, Chicago, Ill. Center for Health Services Research and Development.
Task Delegation in Physician Office Practice.
Barbara H. Kehrer, and Michael D. Intriligator.
Nov 73, 23p
Contract PHS-HSM-110-70-354

Descriptors: United States, Research, Physicians, Nurses, Health resources, Health occupations, Health manpower, *Health care utilization, Health care delivery, *Allied health personnel.

Findings of an analysis of the relationships between delegation of tasks to allied health personnel in physicians' office practices and other practice characteristics are reported. A 1971 nationwide survey of physicians conducted by the American Medical Association obtained data, for each of ten tasks, on the percent of time the task was performed by allied health personnel and the type of allied personnel most likely to perform the task. Analysis of these data indicates that delegation is more likely: (1) for more technical office procedures that can be easily routinized such as immunizations and electrocardiograms as opposed to those requiring clinical judgment; (2) for group practice physicians than for solo practitioners; (3) for general practice, internal medicine, general surgery, and pediatrics, in regions of the Nation other than the Northeast and Middle Atlantic; and (4) to registered nurses, rather than to other types of allied health personnel. Tabular data are included, and directions for future studies in this area are noted. Portions of this document are not fully legible.

HRP-0007364/3GA Not available NTIS
Johns Hopkins Hospital, Baltimore, Md.
Computer-Based Unit Dose Drug Distribution System at Johns Hopkins Hospital: Second Generation.
Henry J. Derewicz, and Donald W. Simborg.
1975, 11p
Pub. in Hospital Pharmacy v10 n10 p417-418, 420-2, 427-30, 432-3 Oct 75.

Descriptors: Therapy, State regions, Radiotherapy, Psychotherapy, Physicians, Patients, Methodology, Maryland, Inpatients, Innovations, Information systems, Information retrieval, Hydrotherapy, Health occupations, Health manpower, Health care, Health care technology, Health care services, Data processing, Data processing systems, Data analysis, Chemotherapy, Biomedical information systems.

The development and operation of a computer-based unit dose drug distribution system at Johns Hopkins Hospital in Baltimore, Maryland are discussed. A computer-based decentralized unit dose drug distribution system was initiated at Johns Hopkins in May 1970 and subjected to cost-effectiveness evaluations. These studies demonstrated methods by which significant improvements could be made, and the improvements were incorporated into a second-generation computer-based unit dose drug distribution system known as MIDS (Medication Information and Distribution System). MIDS is a system which has unit dose packaging, unit dose distribution, decentralized pharmacy service, medication administration recording, and a computer to control the entire system. Physician medication orders are entered into the computer by on-line terminals in satellite pharmacies. Upon request, the computer prints an envelope with an individual patient's medication order for a given hour. A dose of medication is placed in the envelope, and envelopes for a given patient care unit are delivered immediately before the scheduled medication administration time. Empty envelopes are returned to the pharmacy for charting by pharmacy personnel using computer terminals. The computer system produces a daily drug profile and provides a capability for capturing and retrieving drug usage data and individual patient drug data. Future applications of the MIDS are discussed.

HRP-0007366/8GA Not available NTIS
Booz-Allen and Hamilton, Inc., New York.
Allocation of Resources for Ambulatory Care - A Staffing Model for Outpatient Clinics.
Bruce D. Mansdorf. 1975, 9p
Pub. in Public Health Reports v90 n5 p393-401 Sep-Oct 75.

Descriptors: System analysis, State regions, New York, Methodology, Mathematical models, Health resources, Health manpower, Health care, Health care utilization, Health care facilities, Data processing, Data processing systems, Data analysis, *Ambulatory health care.

A model for outpatient clinic staffing is developed as an analytical tool for allocating and monitoring the utilization of health manpower. Developed by the Office of Program Analysis of the New York City Health and Hospitals Corporation, the model is intended to determine the most efficient and equitable allocation of clinic staff among an institution's outpatient clinics. Given a specified set of medical and administrative constraints, various mixes of resources can be used to produce a measure of clinic service. Decision variables used in the model include: physician-patient contact time, utilization of physician capacity, and ratio of house-staff hours to total physician hours. The model hypothesizes the relationship between the variables and determines an efficient staffing configuration. Application of the model to four hypothetical clinic configurations is assessed. The model provides administrators with an easily implementable tool for efficient and equitable allocation of scarce resources. In addition, the model can be applied to all aspects of ambulatory care delivery for which characteristics can be quantified. Supporting data and mathematical equations are included.

HRP-0007369/2GA Not available NTIS
American Public Health Association, New York.
Schools of Public Health - How Relevant to the 1970's.
James R. Kimmey. 1970, 4p
Pub. in American Jnl. of Public Health v60 n11 p2086-2089 Nov 70.

Descriptors: Vocational guidance, Universities, Theories, Schools, *Public health, Participative management, Methodology, Medical education, Management, Local government, Health resources, Health related organizations, Health planning, Health manpower, *Health manpower education, Health education, Health care requirements, Curricula, Consumers, Community relations, Agencies, Advanced programs.

The relevancy of schools of public health to community needs of the 1970's is investigated. In view of the changed character of community health, it is recommended that schools give entering students a perspective and philosophy, develop relationships concerning current problems by going into the community, and provide such skills and experiences as are feasible in terms of what students bring to schools. Public health now encompasses direct medical care, establishment of standards for clinical and institutional practice, organization and administration of a variety of community health programs, and many other programs and services. The practice of public health may take place in neighborhood health centers, in a Model Cities agency, under the auspices of an urban coalition, and in other settings that did not exist a few years ago. Three issues are emphasized in relation to making schools more relevant to new concepts of public health: (1) concentrate on developing in master-level students an ecological perspective and a philosophical base for the practice of public health; (2) restructure curricula so as to make maximum use of the skills and experiences of students; and (3) develop relationships concerning current problems, not through outreach programs in which the school goes into the community but rather by bringing the community into the school through entry-level training and career ladder programs in the various public health content areas.

HRP-0007407/0GA Not available NTIS
Practice Costs: How High Will They Go.
Arthur Owens. 1970, 11p
Pub. in Medical Economics p81-91 23 Nov 70.

Descriptors: Utilization, United States, Physicians, Medical services, Income, Health occupations, Health manpower, Health care facilities, *Health care costs.

The rising costs of medical practice are examined. It is noted that office salaries and bonuses, rent, supplies, and other professional expenses are increasing, in some cases, faster than the overall cost of living. Three out of five private physicians who practiced alone paid out an average of 14 percent more in tax deductible professional expenses in 1969 than they did in 1968. In contrast to higher costs, the average net income of the same physicians rose less than 10 percent. Graphic illustrations are presented to show the normal range of professional expenses, increases in practice costs in five major fields, number of doctors affected in each of these major fields, range of total professional costs in the five fields, trends in major expense items (office salaries and bonuses, office space, and drugs and medical supplies), variations in expenses according to the amount of business conducted and according to re-

gion, and relation of office size to payroll and space costs. The survey, conducted in 1970, involved self-employed physicians under age 65 and it was felt that the distribution of surveyed physicians closely approximated that of the statistical universe for specialty, geographic area, and age.

HRP-0007418/7GA Not available NTIS
Kansas Univ., Kansas City. School of Medicine.
Rural Preceptorship: A Ten-Year Report on the K.U. Program.
Jesse D. Rising. 1961, 4p
Pub. in Jnl. of the Kansas Medical Society v63 n81 p81-84 Mar 62.

Descriptors: State regions, *Rural health services, Rural areas, Kansas, Health resources, Health manpower, *Health manpower education, Health education, Health care services, Curricula.

The rural preceptorship program of the University of Kansas School of Medicine is evaluated in its tenth year, and the philosophy behind the program is reviewed. The preceptorship program, established in 1951, provides medical students with a type of 'retreat,' during which they may develop ideas concerning their own values and goals. The experience permits students to participate almost totally in a 'medical way of life' with a physician carefully selected by the school. Preceptorships, established only in towns of less than 2,500 population, are compulsory during the senior year. Each student is assigned to a preceptor for 5.5 weeks, during which time the students are treated as colleagues by the participating preceptors. Students make house calls with the physician, participate in hospital rounds, and take an active part in office routine. The preceptors, students, and School of Medicine faculty continually evaluate the program. In addition, a questionnaire was sent to the approximately 1,000 graduates of the ten classes of 1951 to 1960. Some 686 responses were received from 40 States, Puerto Rico, and six foreign countries. The vast majority of respondents indicated that the preceptorship program had been of value for them. It is noted that the preceptorship program is not aimed primarily at obtaining general practitioners for rural areas, but rather attempts to provide all students at least one opportunity for direct contact with the private practice of medicine. Tabular data are provided. A copy of the questionnaire is not included.

HRP-0007438/5GA Not available NTIS
Podiatric Medicine: Function and Education.
1972, 8p
Pub. in Jnl. of Podiatric Education v4 n1 p6-13 Mar 73.

Descriptors: Health resources, Health occupations, Health manpower, *Health manpower education, Health education, Allied health personnel.

The scope of practice for podiatric medicine is defined and education for podiatry is discussed. Podiatry is concerned with examination, diagnosis, treatment, and care of the human foot by medical and surgical means. Practitioners are licensed by State Boards of Podiatry Examiners or by a national board following training at a college of podiatric medicine. The doctor of podiatry should provide high-quality diagnostic service and, because of education and training, may be a source of referral to other medical specialists. The need for podiatrists is growing because of an increased demand for better health care, expanded government payments, and increases in those populations needing podiatric care (primarily the aged). At the same time, the ratio of podiatrists to population has been decreasing. Podiatrists may receive their professional education at five independent, nonprofit colleges of podiatric medicine; these colleges receive limited Federal grants. The minimum requirement for entrance to a college of podiatry is at least two years of premedical study at an accredited college or university. The curriculum consists of over 4,000 hours of instruction over a four-year period. Approximately 50 percent of all graduates continue their education by entering one-year and two-year postgraduate residency training programs.

HRP-0007464/1GA Not available NTIS
Cincinnati Univ., Ohio. Coll. of Community Services.
Bookshelf on Community Planning for Health.
Marvin D. Strauss, and Ido de Groot. 1971, 24p
Pub. in American Jnl. of Public Health v61 n4 p656-679 Apr 71.

Descriptors: State regions, Sources, Ohio, Objectives, Methodology, *Health planning, Health care, Government policies, Documents, Availability.

Following an overview of the history of community health planning as reflected in the development of the Public Health Federation of Cincinnati, Ohio, a bibliography of materials concerning community health planning is presented. The introductory essay suggests that the health council model may be more useful than the health facilities planning agency model in considerations of comprehensive health planning. The bibliography includes newsletters which focus on health planning, resources of special interest, periodicals, journal articles, books, and government publications. Over 600 items, dating from 1945 through 1970, are listed.

HRP-0007467/4GA Not available NTIS
Colorado Dept. of Health, Denver. Div. of Public Health and Preventive Medicine.
Involving the Urban Poor in Health Services through Accommodation - the Employment of Neighborhood Representatives.
James A. Kent, and C. Harvey Smith. 1967, 7p
Pub. in American Jnl. of Public Health v57 n6 p997-1003 Jun 67.

Descriptors: Urban areas, Sociology, Socioeconomic status, Socioeconomic factors, Reviewing, Research, Participative management, Methodology, Management, Local government, Health planning, Health care, *Health care services, Health care delivery, Feasibility studies, Evaluation, Demography, Consumers, Community relations, Communities, Comments, Assessments, Agencies.

The involvement of urban poor in health services through efforts to accommodate individual motivational orientation is discussed. It is felt that users of health care services in ghetto areas can be reached if their particular cultural and economic background is taken into account. It is suggested that, in ghetto areas, neighborhood representatives may be uniquely suited to involve disadvantaged clients in health care programs. The following concepts are emphasized: (1) patient accommodation as a means whereby disadvantaged individuals can be recruited to health care; (2) the urban neighborhood as the basic unit for organizing health care programs; and (3) employment of indigenous workers to involve disadvantaged patients in the accommodation process. The selection, recruitment, training, and supervision of neighborhood representatives are discussed. It is contended that the accommodation of prospective patients by helping to solve their immediate problems must be a component of medical care programs designed to involve hard-to-reach individuals. Furthermore, in order for accommodation to occur, public health programs must become specific to particular cultural and economic groups.

HRP-0007474/0GA Not available NTIS
Factors Influencing the Effectiveness of Health Teams.
Irwin M. Rubin, and Richard Beckhard. 1972, 17p
Pub. in Milbank Memorial Fund Quarterly p317-335 Jul 72.

Descriptors: System analysis, Standards, Reviewing, Quality assurance, Methodology, Measurement, Health resources, Health occupations, Health manpower, Health care, Health care delivery, Evaluation, Data processing, Data analysis, Criteria, Assessments.

Factors which influence the effectiveness of health teams are reviewed. Group dynamics is discussed in terms of seven selected characteristics or variables known to be of importance in any group situation: goals or mission, internal role expectations, external role expectations, decision-making, communication patterns, leadership, and norms. These group factors are related to a group setting, in particular to community-based total health care. A case study involving a health team improvement effort is reported. The short time frame within which the study was carried out dictated limited objectives. Short-term changes were observed and documented in terms of greater work productivity, particularly with respect to team conference meetings; increased clarity of role expectations and mechanisms for negotiating changes in role behavior as needed; greater flexibility in decision-making; and more widely shared influence and participation among all team members. Implications for health team operations were derived from the case study effort which relied heavily upon a simple model known as the action research approach. The basic flow of activities in this approach was outlined as follows: data collection, summarization and feedback, action planning, and evaluation. It is envisioned that an increasing number of models will emerge for delivering health care in which some form of groups play an integral part.

HRP-0007487/2GA Not available NTIS
Dalhousie Univ., Halifax (Nova Scotia). Dept. of Sociology and Anthropology.
Cultural Barriers to the Utilization of Health Services.
Jean Leonard Elliot. 1972, 8p
Pub. in Inquiry v9 n4 p28-35 Dec 72.

Descriptors: Sociology, Socioeconomic status, Socioeconomic factors, Methodology, Measurement, Health status, Health care, *Health care utilization, Foreign countries, Demography, Communities.

The findings of an assessment of health levels in three Nova Scotia communities are reported. The study was undertaken to determine the extent to which medical services are utilized and to determine whether cultural factors operate as barriers to participation in health services. Each target community has a history of medical deprivation, a definitive ecological boundary, and a distinctive ethnic base. Each is either culturally or geographically isolated from the core society. Two rural communities and one urban housing project participated in the household survey. Data indicated that the cultural barriers investigated are potentially more relevant in the two rural communities than in the urban housing project. Variables centering upon self-treatment tended to be more strongly associated with the over-representation of medically untreated symptoms in rural communities than in the urban area. It was observed that, although self-treatment may be more prominent in the two rural communities than in the urban area, factors explaining the phenomenon may be dissimilar. The home remedy history of the isolated fishing community of Tancook Islands appears to be the key to understanding self-treatment in that community, while the cultural

isolation of the black community semi-rural Upper Hammonds Plains may explain the proclivity toward self-treatment there. In both communities, distance from a medical center and absence of a resident physician would also have to be considered. Implications of the study findings are discussed, and tabular data are included.

HRP-0007521/6GA PC$5.50
Comprehensive Health Planning Council of South Florida, Inc., Miami.
Mental Health Plan for Dade County with Future Projections.
Jan 73, 122p

Descriptors: Strategy, State regions, Plans, Methodology, *Mental health care, Implementation, *Health planning, *Health care delivery, Florida, Annual.

Based on the findings of the Mental Health Planning Committee of the Dade County Mental Health Consortium, a mental health plan for the County is presented, including short-range (1973-1974) priorities and long-range (1974-1980) goals. The document includes a description of the Committee's study approach, a summary of findings with regard to specific problem areas and funding, observations, a statement of goals and principles accompanied by a model for a mental health system, and recommendations. It was found that the delivery of mental health services in Dade County as of January 1973 represented a fragmented, non-system which reached a minority of those in need. Specific problems are identified in the areas of geriatric services, children under age 13, individuals in trouble with the law, services for teenagers, and payment of mental health services. Appended materials include data from site visits, socioeconomic and mental health agencies data, a description of Dade County and catchment area data, a description of the Citizens Information Service, and programs and budgets considered for recommended mental health-related projects. Portions of this document are not fully legible.

HRP-0007532/5GA PC$3.50/MF$3.00
Capital Area Planning Council, Austin, Tex.
Study of CAPCO Medically Underserved Areas.
Robert R. Hicks. Jul 74, 14p

Descriptors: Texas, Statistical distributions, State regions, Standards, Reviewing, Quality assurance, Physicians, Methodology, Measurement, *Health resources, Health occupations, Health manpower, Health care, Health care delivery, Evaluation, Distribution, Demography, Criteria, Communities, Assessments.

Medically underserved areas in the Capital Area Planning Region of Texas (CAPCO) are identified through use of the Index of Medical Underservice (IMU). By analyzing four variable factors related to the provision of health care, the index achieves a comparative ranking of adequately served areas. Within the CAPCO region, nine of the ten counties have IMU values under the proposed cutoff of 65. Several counties are in the lower quarter of the groupings, and only Travis County achieves an index value above 65. The nine counties surrounding Travis County have a total physician / population ratio of 1:1555, which compares unfavorably to the rest of rural Texas which has a ratio of one physician for every 1,467 persons. The State has an overall ratio of 1:925 and the U.S. has a ratio of 1:665. The average age of physicians in the nine counties is well over 50 and the influx of new physicians is relatively low. In determining areas of underservice, particularly in rural areas, these factors of population ratios, age characteristics, migration patterns, and retention capabilities must be considered.

HRP-0007541/6GA Not available NTIS
American Rehabilitation Foundation, Minneapolis, Minn. Health Services Research Center.
Health Maintenance Strategy.
Paul M. Ellwood, Nancy N. Anderson, James E. Billings, Rick J. Carlson, and Earl J. Hoagberg. 1971, 8p
Pub. in Medical Care v9 n3 p291-298 May-Jun 71.

Descriptors: Private organizations, Private institutions, *Prepaid health care, Organization theory, Health resources, Health related organizations, *Health maintenance organizations, Health insurance, Health care services, Health care delivery, Financing.

A health maintenance strategy is discussed which envisions a series of government and private actions designed to promote a highly diversified, pluralistic, and competitive health industry. Such a health maintenance strategy would apply the economic leverage of the Federal Government's purchasing power and its persuasive influence to create a competitive health industry in which health services would increasingly be provided by health maintenance organizations (HMOs). The strategy assumes that HMOs are capable of producing services more economically and effectively than conventional providers by integrating and coordinating the many elements of health care through the incentive of sharing the economic risk of illness with subscribers. The emergence of a free market economy could stimulate a course of change in the health industry that would have some of the classical aspects of the industrial revolution: conversion to larger units of production, technological innovation, division of labor, substitution of capital for labor, vigorous competition, and profitability as the mandatory condition of survival. Under such conditions, HMOs would have a vested interest in regulating output, performance, and costs in the public interest, with minimal intervention by the Federal Government. Such a health maintenance strategy offers a common cause for the collaboration of professional, public, and private enterprise sectors of the health industry in alleviating the medical care crisis in a rational and timely manner, as a feasible alternative to nationalized health care. The health maintenance strategy is based on the promotion of a highly diversified and competitive health maintenance industry, with consumers being able to purchase health maintenance services from a variety of competing organizations. The health maintenance strategy would reorient the health industry so that its natural forces are compatible with the public interest.

HRP-0007546/5GA PC$4.00/MF$3.00
National Council on the Aging, Washington, D.C.
Participation of the Elderly Poor in Senior Centers. A Technical Assistance Monograph.
Sondra K. Match. May 70, 48p

Descriptors: Urban health services, Urban areas, Rural health services, Rural areas, Participative management, Methodology, Management, Local government, Health planning, Health care services, Consumers, Community relations, Agencies.

Practical ground rules are offered for the organization and operation of senior centers in urban and rural areas, based on a series of papers concerned with participation of the elderly poor in senior centers. Although each author's experiences are derived from a distinctly different population base, including the middle class city resident, rural retiree, former blue collar worker, and the older poor, their concepts of the senior center and citizen participation are universal and interchangeable. In the lead article, a comprehensive picture of the ideal senior center is presented, with descriptions of facilities and programs that transcend geographical boundaries. A discussion geared to the rural setting is presented which gives step-by-step advice on how to establish and maintain a center for the elderly. The final two papers note the exclusion of older persons from policy-making roles in the senior center and warn that this prevalent trend must be reversed. One paper discusses professional attitudes toward the elderly, while the other paper offers a scholarly and perceptive analysis of the complex relationship between poverty, dependency, and lack of involvement of elderly poor. The latter paper describes how the poor have internalized the negative attitude of the affluent toward them and how this attitude has become institutionalized in the maintenance of organizations which justify and perpetuate the entire cycle. It is suggested that the cycle will be broken only when the right issue develops and the elderly poor have the opportunity to control things themselves.

HRP-0007551/5GA Not available NTIS
Rochester Univ., N.Y. School of Medicine and Dentistry.
Attitudes of Physicians Toward Small-Community Practice.
Ralph C. Parker, and Thomas G. Tuxill. 1967, 18p
Grant PHS-HM-26601
Pub. in Jnl. of Medical Education v42 n4 p327-344 Apr 67.

Descriptors: Urban health, Urban areas, Statistical distributions, Rural health, Rural areas, Research, *Physicians, Mobility, *Health resources, Health occupations, *Health manpower, Health manpower education, Health education, Health care, Health care services, Health care delivery, Distribution, Demography, Communities.

A study on the motivation of physicians for or against small community practice is reported. A questionnaire was developed for the study and pretested using a few selected physicians in communities of varying size. Following this pretest, a total of 1,475 physicians within an 11-county region were sampled. The majority of small community physicians surveyed grew up in a small community and chose to practice there because they liked the life and had the opportunity to quickly build busy practices. The majority of large community physicians grew up in urban areas and chose to remain there because of a preference for urban living, their feeling that specialization is incompatible with small community practice, and the availability of large medical centers. The influence of medical educators on medical student and house officer decision-making with regard to future small or large community practice was examined. It was evident from the study findings that a decreasing number of physicians are establishing small community practices. Many young specialists tend to migrate to medium-sized communities with good community hospitals and openings available in medical groups, and it is considered likely that the number of generalists practicing in small non-hospital towns will continue to decrease at a rapid rate. It is recommended that those in medical education thoroughly understand the needs and resources of communities outside their immediate medical center environment and take these into consideration when they counsel prospective doctors.

HRP-0007552/3GA Not available NTIS
Rochester Univ., N.Y. School of Medicine and Dentistry.
Social, Economic, and Demographic Factors Affecting Physician Population in Upstate New York.
Ralph C. Parker, Thomas G. Tuxill, and Richard A. Rix. 1968, 7p
Pub. in New York State Jnl. of Medicine v69 n5 p706-712 1 Mar 69.

Descriptors: Statistical distributions, State regions, Rural areas, *Physicians, New York, *Health resources, Health occupations, Health manpower, Health care, Health care services, Distribution, Demography, Communities.

Findings of an investigation of the relationship between physician population density and certain economic and population factors in an 11-county, semirural region of upper New York State are reported. Data analyzed were drawn from census sources and from State Department of Commerce sources, and were classified in two ways: by towns losing or gaining physicians, and by hospital service areas losing or gaining physicians. Several population variables were examined: (1) percent of population in agriculture; (2) median school years of population; (3) percent of population completing high school; (4) median income; and (5) percent of population moving to a new home from 1954 to 1960. Statistically significant differences were found when the change in number of physicians was related to the variables town by town as well as when the ratio of physicians to population was related to the variables service area by service area. Findings indicate that towns with a relatively high percentage of the population in agriculture, low median school years, low percentage of high school graduates, low median income, and low percent moving to new homes are in an unfavorable position with regard to obtaining or retaining physicians. Implications of the findings for health care in small communities are discussed. Ways in which communities which are marginal with regard to physician-to-population ratio and position on the social, economic, and demographic scale might boost their physician populations are suggested, as are alternatives for those communities that realistically cannot expect to replace the physicians they are losing. Supporting data are included.

HRP-0007583/1GA Not available NTIS
Caldwell Memorial Hospital, Idaho.
Rural Hospital in Today's Health Care Scene.
John W. Hayman. 1968, 4p
Pub. in Hospitals, Jnl. of the American Hospital Association v42 n11 p63-66 1 Jun 68.

Descriptors: *Rural health services, Rural areas, Patients, Inpatients, *Idaho, Health resources, Health care services, *Health care requirements, Health care facilities, Acute care.

The needs of rural hospitals in the areas of manpower, communications, transportation, planning, and national leadership as of 1968 are discussed, based on observations concerning the status of hospital services in rural Idaho. It is pointed out that rural hospitals, at this time, were facing a severe shortage of medical and paramedical personnel, and that recruitment was becoming increasingly difficult. Communications among rural hospitals are described as archaic, and transportation in rural areas as often slow, if not impossible. State and national associations, it is suggested, fail to recognize the problems of rural hospitals, but must begin to provide leadership and guidance if rural hospitals are to survive. Regional medical programs, such as the Mountain States Regional Planning Program for heart disease, cancer, strokes, and related disease initiated in Idaho, Montana, Wyoming, and Nevada in 1966, hold great promise for easing shortages of health services in rural areas. The potential benefits of conferences such as that sponsored in March 1968 in Seattle by the American Medical Association's Council on Rural Health are pointed out. However, poor representation of States with large rural areas at that conference is noted. Coordination of efforts on the part of individual physicians, local and State medical societies, hospital administrators and boards of trustees, the American Hospital Association, and State hospital associations is seen as necessary for solving the problems of health care delivery in rural areas.

HRP-0007557/2GA PC$3.50/MF$3.00
Comprehensive Health Planning Council of South Florida, Inc., Miami.
Study of the Advisability of the 'Seed' in Dade County.
Nov 72, 25p

Descriptors: State regions, Research, *Mental health care, Health care services, *Health care delivery, Florida.

A study of the advisability of establishing a drug rehabilitation program in Dade County, Florida, patterned after the Seed, Inc., program in Broward County is documented. The Seed program, with its unique combination of rehabilitative techniques, large number of participants, and high claims of success, had achieved broad favorable publicity in Broward County, and had created considerable controversy. The target population, costs, peer pressure and confrontation techniques, and staff of the Broward County Seed are discussed, and strengths and weaknesses of specific program elements are identified. Evaluations of the Seed program by the National Institute of Mental Health and by the State Drug Abuse Program are summarized, and the Seed's success rate is examined. Criteria established by the Dade County Health Planning Council for development of drug abuse rehabilitation programs are noted, and the extent to which the Seed program in Broward County appears to fulfill each criterion is discussed. The study findings led to a recommendation that the Seed program be encouraged to initiate operation in Dade County, given compliance with County guidelines. Expressed concerns about establishment of a Seed program in Dade County are outlined in an Appendix.

HRP-0007580/8GA Not available NTIS
Interactive Television Network, Burlington, Vt.
Two-Way Closed-Circuit Television Offers Educational Programs.
Jacques A. Marquis. 1975, 4p
Pub. in Hospitals, Jnl. of the American Hospital Association v49 p85-86, 88-89 16 May 75.

Descriptors: Vermont, Universities, Schools, Regions(United States), Organization theory, New Hampshire, Medical education, Interactions, *Health resources, Health related organizations, Health manpower, *Health manpower education, Health education, Health care services, Coordination, Cooperation, Agreements.

The Interactive Television Network (INTERACT), a two-way communication system between several health care institutions in Vermont and New Hampshire, is described. Institutions involved in the network include two university medical centers, three community hospitals, a vocational technical college, and a State prison. All of these institutions originate and receive programs via high quality duplex video and audio signals transmitted over a closed-circuit microwave system. Two telemetry channels are available for diagnostic uses and computer data. INTERACT provides communication between medical center resources and community health providers, assists medical schools in expanding their training programs, and provides medical services and consultations not readily available in small community hospitals. Since the network began full operation in 1972, it has been used an average of 60 hours per week for such purposes as shared grand rounds, guest speakers, seminars, consultations, and adult education courses. INTERACT also provides speech therapy to children in Vermont and is used as a communication device by local and State agencies.

HRP-0007570/5GA Not available NTIS
Yale Univ., New Haven, Conn. School of Medicine.
Unsolved Problem of the Career Professional in the Establishment of National Health Policy.
Albert W. Snoke. 1969, 14p
Pub. in American Jnl. of Public Health v59 n9 p1575-1588 Sep 69.

Descriptors: Personnel management, Orientation(Training), Objectives, National government, Methodology, Manpower, Health resources, Health related organizations, *Health planning, Health manpower education, Health education, Government policies, Government agencies, Agencies.

The role of the health administration professional in shaping health policy is analyzed, and ways of dealing with this aspect of health care in the United States are suggested. Two broad areas are considered: (1) the responsibility of the Department of Health, Education and Welfare and its Public Health Service in the development of national policy for health and for administrative organization for planning and implementation of national health care programs; and (2) the recruitment, education, training, and retention of competent career professionals in health administration who are provided an attractive and stable environment in which they may function effectively. The organizational and administrative history of DHEW and the Public Health Service is traced, and policy-related activities are examined. Two fundamental recommendations arise from a discussion of the career professional in health administration: (1) a long-range program should be developed through a partnership of government and private sectors, concerned with the role, status, recruitment, education, and retention of adequate numbers of health administration professionals; and (2) current (September 1969) uncertainty regarding the organization and leadership for health in DHEW, and particularly the mission, status, responsibility, and future of the Public Health Service, its Commissioned Corps, and its Surgeon General, should be resolved.

HRP-0007575/4GA PC$3.50/MF$3.00
Medical Services Administration, Washington, D.C.
Lessons of Medicaid.
Howard N. Newman. Jun 74, 20p

Descriptors: United States, National government, *Health resources, Health related organizations, Health care facilities, Health care delivery, Government agencies, Financing.

Reflections and a critique on the Medicaid program are offered by the 1970-1974 program manager. It is alleged that Medicaid is too complicated -- the variance in benefits, eligibility, reimbursement procedures, and program administration from State to State causes confusion and frustration to recipients, providers, and administrators. In the absence of an understanding of how the program operates, there is a temptation to use simple formulations and slogans. A lack of consensus exists concerning what Medicaid is intended to accomplish. Some lessons that can be drawn from the Medicaid experience include: (1) financing health care for the poor must be accomplished in the context of a broader solution to the problems of health financing; (2) future health financing programs must emphasize preventive health services for children and outreach built into those programs; (3) integration of health and social services for the elderly at the local level must be encouraged through the removal of financial incentives to institutionalization; (4) incentives in the health delivery system must support efficient and equitable health financing; (5) operating Medicaid through the Federal welfare establishment is in conflict with the

aims of the program; and (6) a climate of moral leadership must pervade our social programs.

HRP-0007583/8GA PC$4.50/MF$3.00
North Carolina Dept. of Human Resources, Raleigh. Div. of Health Services.
Annual Plan of Work FY 1976.
Aug 75, 59p

Descriptors: Strategy, Plans, North Carolina, Methodology, Implementation, Health planning, *Health care delivery, Annual.

A work plan for Fiscal Year 1976 is presented by the North Carolina Department of Human Resources. A statement of need, indication of target population, summary of objectives, schedule of activities, budgetary resource information, and identification of the project manager are presented in a one-page summary format in each of the following areas: central management and coordination, regional management and coordination, statistical processing and analysis, vital records, medical examiner program, public health laboratory, communicable disease control, immunization, tuberculosis, syphilis, gonorrhea, renal disease, multiphasic (chronic disease detection), glaucoma, diabetes, cancer and cancer detection, home health services, epilepsy and neurological disorders, hypertension, migrant health, hospital and medical services for individual State institutions, crippled children's services, family planning, dental disease, maternal and child health, genetic counseling, sickle cell syndrome, perinatal care, developmental evaluation, prekindergarten screening, nutrition, health aid to counties, driver medical evaluation, chemical test for alcohol, accident prevention, bedding control, food and lodging sanitation, shellfish sanitation, solid waste and vector control, veterinary, public health, mosquito control, water supply protection, and pesticide poisoning control.

HRP-0007605/9GA Not available NTIS
California Univ., Los Angeles.
Perceptions of Medical Care. The Impact of Prepayment.
Emil Berkanovic, Leo G. Reeder, Alfred C. Marcus, and Susan Schwartz. 1974, 151p
Available from Lexington Books, 125 Spring St., Lexington, Mass. 02173, $13.00.

Descriptors: State regions, Quality assurance, *Prepaid health care, Oregon, Methodology, Measurement, Health resources, Health insurance, *Health care, Health care delivery, Financing.

The impact of prepayment in health care organization on the perception of medical care is assessed from the points of view of both patient and physician. The report consists primarily of comparisons between a prepaid medical foundation and a non-prepaid fee-for-service system in two Oregon counties. Data were derived from interviews with physicians and Medicaid recipients in each system. Chapters address the following topics: problems of health care in the United States, background information, criteria for assessing health services delivery systems, sample comparison, utilization of health services and preventive education, problems in gaining access to medical services, acceptability of services, physician opinions regarding health maintenance organizations, and data implications for health policy. Questionnaires used in the study are included and a bibliography is provided.

HRP-0007607/5GA Not available NTIS
Yale Univ., New Haven, Conn. Dept. of Epidemiology and Public Health.
Community Participation and Health Resource Allocation.
G. A. Silver. 27 Jan 72, 15p
Pub. in International Jnl. of Health Services v3 n2 p117-131 1973.

Descriptors: Public relations, Public opinion, Public hearings, Political science, Participative management, Objectives, Methodology, Management, Local government, Health planning, Health care, Government policies, Consumers, *Community relations, Agencies.

The political implications and consequences of community decision-making and community control of human service organizations are discussed. A noticeable trend away from autonomous professional decision-making in social issues, including health, is attributed to several factors. First, there has been dissatisfaction with professional decisions, related in part to growing managerial control and distance of managers from clients, and in part to frustration with skewed distribution of products. Second, there has been growing recognition of the political nature of decision-making, regardless of professional input. Third, consumer participation has been introduced into a variety of social models. It is argued that consumer participation, and even consumer control, will not damage the professional's role and may have positive values for the planning and implementation of health systems. Consumer participation at every level, it is suggested, can offset the immobility of large systems, racism, unwieldy bureaucracies, and class discrimination. It is pointed out that, although there is evidence that the traditional system of planning and design of health services is unsatisfactory, little formal evidence has been gathered regarding the value, or lack of value, of consumer participation and control. The need for objective evaluation of the impact of consumer-oriented planning where it is in use is stressed.

HRP-0007610/9GA Not available NTIS
National Center for Health Services Research and Development, Rockville, Md.
Systems Approach to Health Planning.
Vicente Navarro. 1969, 16p
Grant PHS-CH-00158
Pub. in Health Services Research v4 n2 p96-111 1969.

Descriptors: System analysis, Strategy, Methodology, Mathematical models, *Health planning, Health care, Data processing.

A holistic approach to the planning of personal health services is described which considers health services not as an aggregate of independent parts but as interdependent groups forming a unified whole. The approach employs a stochastic model, utilizing a Markov chain that integrates the component parts involved in health service systems, (health services states and transitional probabilities) for planning purposes. The three applications described are prediction, for the ordinary statistical problem of forecasting; parametric study or simulation, for determining the effect on the whole system of simulated changes in its parameters; and goal seeking, for calculating the optimal utilization strategy to achieve a specified goal seeking, for calculating the optimal utilization strategy to achieve a specified goal under given constraints such as minimization of costs or resources. Numerical examples are given for each application. Flow charts and formulas are included.

HRP-0007614/1GA Not available NTIS
Michigan Univ., Ann Arbor. Survey Research Center.
Recommended Variables for the Multiple Stratification of General Hospitals.
Irene Hess, and K. S. Srikantan. 1970, 13p
Pub. in Health Services Research v5 n1 p12-24 1970.

Descriptors: United States, Sampling, Methodology, Health care, Design, Data processing, Data processing systems, Data collection, Data analysis, Data acquisition.

Some characteristics of short-term general hospitals are examined in order to determine which variables, among those for which data are readily available, might be useful for stratification when multipurpose samples of U.S. hospitals are to be selected. Illustrative tabulations are presented in which 1961 American Hospital Association data on 5,078 general hospitals, grouped by hospital control and four approval classes, distributed into four sets of variables. Hospital control includes the following classifications: governmental (non-Federal), church-operated, other nonprofit, for profit; and the four approval classes are defined as: (1) accreditation, medical school affiliation, and internship or residency program or both; (2) accreditation and approved residency or internship program but no medical school affiliation; (3) accreditation but no medical school affiliation and no internship or residency program; (4) none of the four approvals. The four sets of variables include six size classes: 800 or more beds, 400-799, 250-399, 100-249, 50-99, and less than 50; four geographic regions; three Standard Metropolitan Statistical Area classifications grouped according to large (population of 2 million or more), other (less than 2 million) and non-SMSA; and nine geographical regions. The tables and recommendations, including feasible variance reductions, are intended for use in planning hospital studies, particularly when resources and time available for designing a sample are limited.

HRP-0007618/2GA Not available NTIS
Saint Barnabas Hospital, Minneapolis, Minn.
Hospital Costs and Hospital Charges.
John E. Smith. 1970, 9p
Pub. in Minnesota Medicine v53 p225-232 Feb 70.

Descriptors: State regions, Patients, Minnesota, Inpatients, *Health care costs, Acute care.

Findings are presented of a study of costs and charges in short-term hospitals in two counties in the Minneapolis area. Consideration is given to whether the hospital has a training program, percentage of occupancy, and charge per procedure. Findings indicate that employee-to-patient ratios are not related to cost per admission, but are related to presence or absence of training programs. It is recommended that cost accounting be adopted so that hospital governing boards will have the information they need for intelligent planning. Methods that physicians can use to cut hospital costs, are suggested, including: avoiding the use of indiscriminate prescriptions, placing physicians on hospital boards, allowing flexibility of routine orders, allowing out-of-hospital use of facilities, and educating of patients regarding the expense of hospital medicine. Other recommendations include consolidation of some of the hospitals' community services and training programs, and recognition and practice of the chain-of-care concept, which allows patients to move from one level of care to another, i.e., from hospital to extended care, outpatient, nursing home, or at-home care.

HRP-0007621/8GA Not available NTIS
Harvard Medical School, Boston, Mass.
Towns Without Physicians and Towns With Only One - A Study of Four States in the Upper Midwest, 1965.
Ivan J. Fahs, and Osler L. Peterson. May 67, 12p
Pub. in the American Jnl. of Public Health v58 n7 Jul 68.

Descriptors: Supplies, Statistical distributions, South Dakota, Reserves, Regions(United States), *Physicians, North Dakota, Montana,

Minnesota, Methodology, Medical personnel, Measurement, Inventories, Health resources, Health occupations, Health manpower, Health care, Distribution, Demography, Communities.

A study was conducted to evaluate physician supply in more than 1,600 towns and cities in Minnesota, North Dakota, South Dakota, and Montana. The four States in the study area constitute an economic area tied together by trade and showing similar growth and development patterns. In making estimates of the population that did not have ready access to a physician, data were obtained from census maps and American Medical Association directories of physicians. A 15-mile radius was used as an arbitrary definition of remoteness from a physician. Study results are presented in relation to general physician supply, general geographic coverage, no-physician towns, economic growth rates, one-physician towns, model town size and physician status, and characteristics of physicians in one-physician towns. In Minnesota, where population densities are similar to the U.S. average, remarkably few people were remote from a physician according to the 15-mile radius definition. In both North Dakota and South Dakota, with lower population densities, more people were remote from a physician. In Montana, with an unusually low population density, somewhat more than one in 10 of the population could be placed in the remote category. There was a clear relationship between a town's population and its physician status and it was concluded that one-physician towns whose populations were below 1,000 could easily become no-physician towns in the future. Implications of the study results are discussed in terms of specialization, regionalization, and medical care.

HRP-0007624/9GA Not available NTIS
National Center for Health Services Research and Development, Rockville, Md.
Rising Price of Physicians' Services.
Martin S. Feldstein. 1970, 13p
Pub. in the Review of Economics and Statistics v52 n2 P121-133 May 70.

Descriptors: Physicians, Physician extenders, Physician assistants, *Medical services, Health occupations, *Health economics, Health care, Health care utilization, Health care requirements, Economics, Economic theory.

Alternative economic models of the market for physician services are discussed and estimated relations using aggregate time series for 1948 through 1966 are presented. It is demonstrated that aggregate pricing for physician services and use of physician services can be understood best by assuming that permanent excess demand prevails. Sheltered by this excess demand, physicians have discretionary power to vary both their prices and the quantity of services which they supply. There appears to be a tendency to increase prices when a patient's ability to pay improves through higher income or more complete insurance coverage. A supply equation is given which provides evidence to indicate that physicians reduce the quantity of services rendered when fees rise. It is noted that greater use of paramedical personnel and supplies has not decreased the cost and price of physician services. Both supply and price equations indicate that increased governmental provision of medical services has decreased the quantity of private practice services and raised their price. Variables in the estimation of physician rate increases and therefore estimations of the growth of services provided include price, services, demographic characteristics, insurance, and inputs (paramedical personnel, equipment, and supplies). Three models of price and quantity determination are reviewed: an annual equilibrium model, and two dynamic adjustment models.

HRP-0007625/7GA Not available NTIS
Harvard Center for Community Health and Medical Care, Boston, Mass.
Controlling Costs of Medical Care by Expanding Insurance Coverage: Study of a Paradox.
Charles E. Lewis, and Harold W. Kealrnes. 1970, 8p
Pub. in New England Jnl. of Medicine, v282 n25 p1405-1412 Jun 70.

Descriptors: Research, Prepaid health care, Medical services, *Health insurance, Health care services, Health care delivery, *Health care costs, Ambulatory health care.

Special benefits were provided without additional charge to a randomly selected group of 5,000 subscribers in a Blue Cross plan in order to evaluate the control of medical care costs by expanding insurance coverage. Three groups from total Blue Cross subscribers for the period July 1, 1966 to June 30, 1967 composed 85.4 percent of the experimental population: 3,046 public school teachers, 755 city employees, and 454 university employees. Two control groups were randomly selected from groups having between 10 and 100 subscribers each. Special benefits provided to these subscribers covered the costs of diagnostic and treatment services rendered outside hospitals. Experimental benefits did not affect hospitalization and patterns of care. No significant reductions were noted in admissions, days of stay, and payments among either experimental or control groups. Study results supported previous observations in that coverage for ambulatory care did not reduce costs for hospital services. Despite an intensive informational campaign, few subscribers and physicians were aware of the change in benefits. The expected relation between income and frequency of physician contact was not evident among those receiving special benefits. Of all special benefits paid, 18 percent were for psychiatric services to 0.7 percent of the subscribers, and 8.7 percent of physicians in practice received 44 percent of all special benefit dollars. The effects of national health insurance on the control of medical care costs are examined.

HRP-0007647/1GA Not available NTIS
New York City-Rand Inst.
Blood Bank Inventory Control.
John B. Jennings. Feb 72, 8p
Pub. in Management Science v19 n6 p637-645 Feb 73.

Descriptors: Specifications, Performance standards, Massachusetts, Innovations, Health care technology.

A blood bank inventory control model is proposed for individual hospitals and for regional programs. The most common problems in the storage of blood are: a chronically short supply with a limited shelf life: susceptibility to sudden stockouts from unpredictable demands; and high operating costs. A general hospital model structure for a blood bank divides the inventory into two parts: the assigned inventory which has been cross-matched with patients' blood to assure compatibility and has been reserved for those patients, and the unassigned inventory. The flow of blood through this inventory system is described based on data from the Peter Bent Brigham Hospital in Boston, Massachusetts. Interactions at the regional level are proposed in the context of two inventory strategies: shortage-anticipating transfers from one hospital to another, and outdating-anticipating transfers. The model of the hospital blood bank is used as the archtype of the regional system, with central blood supplies modeled implicitly. The effects of several alternative inventory policies are tested through computer simulation. These analyses determine the range in improvements in shortage and outdating performance to be expected in systems of various sizes and the nature of support system capabilities that must be provided. It was found that a group of only five cooperating blood banks can achieve most of the gains available in larger coordinated systems.

HRP-0007660/4GA Not available NTIS
Hospitals and Cost Controls: Road to Crisis.
Donald F. Phillips. 1973, 4p
Pub. in Hospitals, Jnl. of the American Hospital Association v48 p42a-42d 16 Feb 74.

Descriptors: Utilization, United States, Regulations, Legislation, Law(Jurisprudence), Health care facilities, Health care delivery systems, *Health care costs.

Litigation filed by the American Hospital Association (AHA) and other national hospital associations against the Federal government in protest of Phase Four of the Economic Stabilization Program is discussed. The American Medical Association has also threatened suit, contending that the Cost of Living Council overstepped its authority by imposing per admission controls on hospitals. Performance and problems faced by hospitals under Phases Two and Three of the Program are detailed. Noting that controls covering hospital admission costs were not applicable to many other industries including industries supplying goods or services to hospitals, the point is made that hospital controls are discriminatory. The president of the AHA stated before a Senate subcommittee that the controls were 'unlawful, unwise, and unworkable.' In addition, he maintained that the regulations would literally induce hospitals to convert outpatients into short-term inpatients, in order to reduce the hospital's average per admission charges and expenses, and would encourage the transfer of long-term patients in need of intensive care to referral centers, solely for the purpose of improving the hospital's average charges. In conclusion, he stated that the health care sector cannot function and survive if it is subject to mandatory controls, and all the wide variety of goods and services to provide health care institutional settings are not subject to any controls.

HRP-0007681/8GA Not available NTIS
Harvard Center for Community Health and Medical Care, Boston, Mass.
Childhood Characteristics as Indicators of Adult Health Status.
Paul M. Densen, Ellen W. Jones, Doris B. Ullman, and Jules E. Vandow. 1970, 16p
Pub. in Public Health Reports v85 n11 p981-996 Nov 70.

Descriptors: Vital statistics, State regions, Sociology, Socioeconomic status, Socioeconomic factors, Nutrition, New York, *Health status indexes, Health care, Demography, Communities.

A study undertaken to determine which characteristics noted on academic and health records of New York City school children point to physical or behavioral disabilities in early adult ages is reported. A total sample of 3,511 school boys was identified and traced to selective service registration and qualifying examination. The general plan for analysis was to compare selective service rejection rates among school boys with different characteristics on their school records. Childhood characteristics significantly associated with selective service rejection were: uncorrected vision score of 20/50 or worse, cardiac condition, asthma or hay fever, major accidental injury, and health class placement. Physical defects or characteristics not associated significantly with rejection included: eye disease without visual defect, hearing loss or chronic otitis, nutritional problems, orthopedic defects, heights and weights at ages six and fourteen, and birth weight under 2,501 grams. Demographic and socioeconomic

characteristics not significantly associated with rejection were: number of home addresses in grades one through nine, number of school changes, occupation of father on birth certificate, and birth order position. The rejection rate for boys having a behavioral problem was 41.2 percent, while the rejection rate for boys with a physical defect was 40.7 percent. It was suggested that the study findings have implications for school health programs, possibly indicating an epidemiological approach to planning school health services and types of measurements useful in evaluating school health program accomplishments.

HRP-0007684/4GA Not available NTIS
Northwestern Univ., Chicago, Ill. Dept. of Accounting and Information Systems.
Hospital Personnel and Computer-Based Systems: A Study of Attitudes and Perceptions.
James B. Thies. 1975, 12p
Contract PHS-HSM-110-70-368
Pub. in Hospital Administration v50 p17-26 1975.

Descriptors: Sharing, Services, Organization theory, Methodology, Health resources, Health related organizations, Health manpower, Data processing, Data processing systems, Arizona.

Findings of a multihospital evaluation study of hospital personnel attitudes toward computer-based information systems are presented. Five hospitals in the Phoenix, Arizona area sharing a remote computer owned and operated by an independent systems vendor were surveyed; the purpose of the study was to evaluate the shared modular hospital information system concept. An attitudinal scaling instrument was administered three times during the course of the study before systems applications were implemented, six weeks after the application became operational, and approximately six months later. Then, a training evaluation instrument was administered to personnel directly involved with the operation, and finally a questionnaire was administered to each major personnel group near the termination of the project. Results indicate that personnel attitudes toward computer-based systems can be anticipated through analysis of biographical data and that existing attitudes can be readily modified by new experience. Personnel attitudes toward computer-based systems appear to be more significantly influenced by current experiences than by long-standing preconceptions. It also appeared that negative or positive circumstances existing at the time of measurement (systems failure or a program improvement) greatly affected attitudes. Training was more successful if conducted by hospital personnel, and working demonstrations and self-instruction through operational experience were more effective than formal training sessions. An analysis of initial attitudes is included according to personnel classification.

HRP-0007685/1GA Not available NTIS
Dynamics of Ambulatory Surgery.
Thomas R. O'Donovan. 1975, 13p
Pub. in Hospital Administration v50 p27-39 1975.

Descriptors: Innovations, Health resources, Health care technology, Health care services, Health care facilities, *Ambulatory health care.

The trend toward one-day, outpatient surgery for minor procedures is assessed, and its impact on traditional inpatient hospital surgery is discussed. Advocates of outpatient surgery state that it can free hospital beds for seriously ill patients and reduce surgical waiting time for elective surgery. New techniques in anesthesia and in control of bleeding have paved the way for physician and patient acceptance of outpatient surgery. Pediatric surgery is cited as eminently suitable for short-stay surgery, which is said to reduce the psychological trauma of hospitalization for children. In addition, potential benefits of outpatient surgery include reductions in health care costs and maintenance of quality. The controversy between advocates of inhospital and independent surgical center short-stay procedures is discussed, and extension of insurance coverage to each kind of facility is considered. Other factors to be considered in establishing independent facilities include: whether the new facility duplicates existing hospital facilities; under what controls or regulations the facility operates; and whether care is provided only for those who can pay or for indigent patients as well. It is concluded that competition offered by independent facilities, to the extent that it improves quality and access to care without costly duplications of personnel and facilities, is desirable.

HRP-0007693/5GA Not available NTIS
North Carolina Univ. at Chapel Hill.
Practice Characteristics and Quality of Primary Medical Care: The Doctor-Patient Relationship.
Barbara S. Hulka, Lawrence L. Kupper, John C. Cassell, and Robert A. Babineau. 1975, 13p
Pub. in Medical Care v13 n10 p808-820 Oct 75.

Descriptors: State regions, Research, Quality assurance, *Physicians, North Carolina, Methodology, Measurement, Health care, Health care delivery.

The relationship of physician and practice characteristics to the quality of the physician-patient relationship in primary medical care is reviewed. This relationship is defined in terms of communication between physician and patient, patient satisfaction with care, and physician awareness of patient concerns. Study subjects were mothers of infants and pregnant women, representing a random sample of the patients of primary care physicians in a single community. Patients of 49 physicians -- 363 pregnant women and the mothers of 523 infants -- were studied. Communication was found to be better between pediatricians and mothers of infants and between obstetricians and pregnant women, as compared with other physicians. Mothers of infants were more highly satisfied with care provided by residency-trained physicians; pregnant women were more satisfied with non-board certified physicians. Physician awareness of patient concerns presented a mixed pattern of associations with several physician and practice characteristics. The findings suggest that physician credentials are not consistently associated with the three identified dimensions of the physician-patient relationship. Supporting data and examples of survey instrument items are included.

HRP-0007705/7GA Not available NTIS
Differential Patterns in Comprehensive Health Care Delivery for Children and Youth: Health Department, Medical School, Teaching Hospital.
Willy DeGeyndt, and Linda M. Sprague. 1970, 19p
Pub. in American Jnl. of Public Health v60 n8 p1402-1420 Aug 70.

Descriptors: United States, Public health, Projects, Legislation, Law(Jurisprudence), Health care services, *Health care delivery, Health care delivery systems, Ambulatory health care.

Health care delivery patterns resulting from P.L. 89-97, which provides for allotment of Federal funds for child health projects directly to medical schools and teaching hospitals as well as health departments, are analyzed. Data were derived from reports submitted to the Children's Bureau and from a questionnaire submitted to all operating units covering fiscal year 1969. Charts detail location by operating unit, size by location and operating unit, and proportion of children to size of unit. Children and Youth Projects affiliated with a health department (State, county, or city) may be located in the central city or in peripheral urban or rural areas. They usually have a close working relationship with other community resources and an established practice of referrals through other agencies. Health department projects exhibit greater outreach and appear to move new registrants more rapidly through the system. Projects managed by teaching hospitals are primarily located in the central city. These projects tend to draw heavily upon the outpatient department and emergency room as referral sources and probably register children with more serious pathological conditions. Teaching hospital projects, it is noted, lack cooperation and coordination with community agencies. Projects affiliated with medical schools are located in both central city and peripheral areas. Medical school projects register and serve a higher proportion of children in their area than other types of projects, but also utilize the outpatient and emergency departments as referral sources. It is observed that medical school projects are more expeditious in performing medical functions than teaching hospital projects.

HRP-0007707/3GA Not available NTIS
Maternal and Child Health Service, Rockville, Md.
Recommended Guidelines for PKU Programs for the Newborn.
1971, 15p
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $.40.

Descriptors: Safety engineering, Preventive medicine, Prenatal care, Pregnancy, Plans, National government, Methodology, Medical services, Health resources, Health related organizations, Health care technology, Health care services, *Health care delivery, Government agencies, Children, Child health services, Ailments.

Guidelines recommended by the Maternal and Child Health Service within the Health Services and Mental Health Administration of DHEW for newborn phenylketonuria (PKU) programs are presented. The Maternal and Child Health Service recommends that all newborn infants be screened for PKU. The objective of screening programs is to find affected children at a time when intervention may prevent the ill effects of the disease, particularly mental retardation. The ultimate value of screening programs, however, should be measured in terms of the final outcome of patients placed under treatment or follow-up programs. Follow-up services are considered to be an integral part of a total PKU program. Guidelines are presented for the development of a comprehensive PKU screening program, and the use of screening tests which are simple and reliable in detecting phenylalanine in the blood is recommended. Suggested steps in screening and diagnosis are outlined, with particular emphasis on full-term infants, premature infants, and newborn siblings of PKU patients. Follow-up screening tests and services for infants and patients with PKU are discussed, along with comprehensive multidisciplinary services for long-term follow-up and care. Comprehensive services involve pediatric, nutrition, nursing, social, psychological, and biochemical laboratory and consultation services. The clinical management of patients with PKU is reviewed.

HRP-0007714/9GA Not available NTIS
Johns Hopkins Univ., Baltimore, Md. School of Hygiene and Public Health.
Community as an Epidemiologic Laboratory. A Casebook of Community Studies.
Irving I. Kessler, and Morton L. Levin. 1970, 330p

Available from Johns Hopkins Press, Baltimore, Md. 21218, $13.50.

Descriptors: Surveys, South Carolina, Sociology, Socioeconomic status, Socioeconomic factors, Rhode Island, Research, Regions(United States), North Carolina, New York, Minnesota, Michigan, Methodology, Mental health care, Medical services, Measurement, Massachusetts, Maryland, Health care, Health care requirements, *Health care delivery, Georgia, Foreign countries, Demography, Data collection, Data acquisition, *Communities, California.

Sixteen community studies are presented which exemplify approaches taken by numerous investigators in the field of community epidemiology. Three of the studies are concerned with a variety of medical conditions, four with cardiovascular disease, four with social factors in health, two with psychiatric symptoms, and three with the collection of comprehensive health-related data on a national basis. A wide spectrum of communities ranging from a rural area of 7,000 persons to the entire United States is encompassed, representing the United States, Puerto Rico, and Columbia, South America as well as the U.S. In some of the studies, entire communities were surveyed. In other studies, samples were selected and, in a few, both methods were employed. The study instruments included private censuses, personal interviews, interviewer observations from personal interviews, mailed questionnaires, physical examinations, screening examinations, and reviews of existing medical and vital records. Included in the compilation of community studies are the following: (1) discussions on comprehensive disease investigations in the total communities of Tecumseh, Michigan and Rochester, Minnesota; (2) epidemiological surveys of specific medical conditions in Washington County, Maryland; Framingham, Massachusetts; Evans County, Georgia; Charleston, South Carolina; and the State of North Carolina; (3) social surveys in Alameda County, California; Washington Heights, New York City; and the State of Rhode Island; (4) psychiatric surveys in Sterling County, Nova Scotia; New York City; and a New England hospital; and (5) national health surveys in the United States, Puerto Rico, and Columbia, South America.

HRP-0007715/6GA PC$5.00/MF$3.00
California Univ., Berkeley. Neighborhood Health Center Seminar Program.
National Health Proposals, the Neighborhood Health Center and the Poor.
Allen Ferguson. Oct 71, 76p

Descriptors: Prepaid health care, Legislation, Law(Jurisprudence), Health resources, Health insurance, Health care facilities, Health care delivery, Health care delivery systems, Financing.

Issues and proposals concerning national health policy are examined as an aid to Office of Economic Opportunity (OEO) Neighborhood Health Center staffs in assessing the chances for neighborhood health center development and survival and in promoting the interests of low income people during the course of the debate over national health policy. Basic issues behind the national health debate are considered, including: health care as a right, health care costs and financing, the role of private enterprise in health care, maintenance of quality care, and methods of health care delivery. An overview is presented of six national health proposals: (1) the 'Health Partnership' proposal of the Nixon Administration; (2) the Health Security Act introduced by Senator Edward Kennedy; (3) the American Medical Association 'Medicredit' Plan; (4) the National Health Insurance and Health Improvement Act of 1971 introduced by Senator Jacob Javits; (5) the Catastrophic Illness Insurance Act sponsored by Senator Russell Long and other members of the Senate Finance Committee; and (6) the National Health Plan sponsored by the Medical Committee for Human Rights. Following a comparison of the degree of coverage, benefits, expenses to patient, financing mechanisms, and payment to providers represented by each proposal, an analysis is presented, including a summary of the advantages and disadvantages of each proposal, implications for low income individuals, and possible effects on Neighborhood Health Centers. Appended materials include an explanation of the 12 criteria used in the evaluation, and a glossary of relevant terms.

HRP-0007727/1GA Not available NTIS
Maruna (Dan) and Associates, Inc., Irvine, Calif.
HMO Complex: Auxiliary Corporations.
Dan Maruna. 15 Dec 72, 31p
Available from Protech, 2182 Dupont Drive, Irvine, Calif. 92715, $4.00.

Descriptors: Private organizations, Private institutions, *Health resources, Health related organizations, *Health maintenance organizations, Health care facilities, Health care delivery, Financing.

The auxiliary corporation as a mechanism for giving prepaid health plans the opportunity to become 'health conglomerates for overall mutual benefit' is discussed. The auxiliary corporation provides a mechanism for cost control, management, and orderly growth within the Health Maintenance Organization (HMO) complex. The auxiliary corporation is a vehicle for recycling dollars within a 'community of legal entities' -- corporation, partnership, joint venture, co-op, or sole proprietorship. It is noted that the principals in the development of an HMO complex must agree as to what type of legal structure is to be utilized in the auxiliary corporations, and as to what products and / or services are to be provided. The nonprofit HMO need not own and operate the auxiliary entity to control it; leverage for control purposes is obtained by providing captive business in return for a mutually beneficial working agreement. The following are among potential areas for development of HMO auxiliary entities: management, data services, marketing, leasing, financial, employment, communications, transportation, consulting, construction, insurance carrier, travel agency, food co-op, gift shop, and dry cleaning. The working relationship between the auxiliary entity and the HMO must provide a legal mechanism for the subscribers of the plan to participate in profit distribution. This mechanism may be in the form of a tax deductible gift from the proprietary auxiliary entity to the nonprofit HMO; a form of patronage dividend; a periodic adjustment of costs; or a preferred rate for services provided. In addition to a general discussion of the auxiliary corporation mechanism and its implementation, special attention is devoted to the organization of auxiliary entities in the areas of management services, data services, marketing, and leasing.

HRP-0007731/3GA Not available NTIS
International Development Research Centre, Ottawa (Ontario).
Health Care in the Peoples Republic of China. A Bibliography with Abstracts.
Shahid Akhtar. 1975, 185p
Available from the International Development Research Centre, P.O. Box 8500, Ottawa, Canada, K1G 3H9, $5.00 (Paper Copy), $1.00 (Microfiche).

Descriptors: Sources, Organization theory, Methodology, Information systems, Health resources, Health related organizations, Health occupations, Health manpower, Health care, Health care utilization, *Health care services, Foreign countries, Documents, Biomedical information systems, Availability.

A bibliography on health services in the People's Republic of China is presented. Material presented in the bibliography was selected based on the premise that its users would include those persons in developing countries who are planning, operating, or evaluating systems to provide health services and those persons concerned with the training of auxiliary health workers to staff such systems; and organizations such as the International Development Research Centre which support research on the problems of organizing and staffing systems for health care services to remote regions. Information contained in the bibliography concentrates primarily on new models of health care delivery and on the training and utilization of auxiliary health workers. The scope of the bibliography includes materials on the following subjects: (1) planning, financing, organizing, utilizing, and evaluating systems designed to provide overall health care to people who lack access to conventional hospital and physician services, with special emphasis on rural areas and metropolitan populations that do not take advantage of metropolitan medical services; (2) impact of health care services on social and economic indices, including demographic indices such as mortality, morbidity, nutrition, and epidemiological trends; (3) relationships between health care systems and other community organizations and services such as schools and agricultural extension programs and community participation in health care systems; and (4) staffing of health care systems, including the functions of various persons, particularly paramedical personnel, their training (curricula), distribution, and utilization. Not included in the bibliography are discussions of basic clinical medicine or biomedical research.

HRP-0007759/4GA Not available NTIS
American Medical Record Association, Chicago, Ill.
Public Law 92-603: PSRO.
Apr 73, 27p
Available from American Medical Record Association, 875 N. Michigan Ave., Suite 1850, Chicago, Ill. 60611, $1.00.

Descriptors: United States, Reviewing, Quality assurance, *PSRO(Professional Standards Review Organizations), *Professional standards review organizations, Peer groups, Methodology, *Medical records, Measurement, Management, Legislation, Law(Jurisprudence), Health planning, Health care, Health care delivery systems, Data processing, Data processing systems, Coordination, Cooperation, Agencies.

Provisions of P.L. 92-603 concerning the establishment of the professional standards review organization (PSRO) are reviewed, with emphasis on the implications of the legislation for medical record practitioners. Major provisions of the legislation are summarized, and excerpts from the statute are presented. Data requirements anticipated for various PSRO activities are outlined, including those related to prospective review of admissions to hospitals and extended care facilities, concurrent review of continuation of care, retrospective review of length of stay and quality of care, ambulatory care, charges for professional services, and reports to statewide professional standards review councils and to DHEW. Examples of existing health data systems are mentioned, and an overview is presented of quality review systems or programs in operation as of spring 1973. Activities of the Experimental Medical Care Review Organization Project, initiated in 1970 by the National Center for Health Services Research and Development to develop working models with which to test the feasibility of ongoing medical care audits, are analyzed. The role of the medical record practitioner in the development of methods for measuring care against established standards is discussed briefly. Changes in the Federal role in allied

health professions education from 1966 to 1972 are reviewed.

HRP-0007761/0GA PC$6.00/MF$3.00
Public Health Service, Rockville, Md.
Health Statistics Plan: Fiscal Years 1976-1977.
Nov 75, 138p

Descriptors: United States, Sources, Methodology, Health care, Data, Data processing systems, Data collection, Data acquisition, Availability.

A statement of the Department of Health, Education and Welfare health statistic activities is presented, with emphasis on certain aspects of those activities which require attention. Opening with an overview of the need for health statistics, the report examines the inadequacies of existing data systems and describes current (November 1975) and planned efforts to ensure that health statistics activities are consistent with Departmental policies and priorities and represent the most efficient ways of collecting needed data. The goals and objectives of the health statistics planning effort are described and the methodology used in preparation of the plan is outlined. Issues and plans for action are then discussed separately for general purpose statistics and for program - specific statistics. A two-year plan is presented which summarizes the key actions proposed for the period beginning July 1, 1975. An inventory is appended which describes health data projects and systems within the following agencies: Alcohol, Drug Abuse, and Mental Health Administration; Center for Disease Control; Food and Drug Administration; Health Resources Administration; Health Services Administration; National Institutes of Health; Social and Rehabilitation Service; and Social Security Administration.

HRP-0007767/7GA Not available NTIS
Illinois Univ. at the Medical Center, Chicago. Coll. of Nursing.
Effecting Change.
Barbara J. Stevens. 1974, 4p
Pub. in Jnl. of Nursing Administration v5 p23-26 Feb 75.

Descriptors: Registered nurses, *Nurses, *Health resources, Health occupations, Health manpower.

The role of the nurse executive in effecting change through administration is explored. If the nurse executive uses management by objective, effecting change is an integral part of the management concept. In planning to implement a change, the nurse executive's first consideration should be an evaluation of the proposed change. The executive must consider not only the desirability of change but also the resources available for implementing change. If the change is deemed desirable, the nurse executive must determine which change process to institute, including the time-frame. Two types of resistance which may confront the change process are that incurred by the nature of the change and that incurred by misconceptions of what the change would mean. Accepting that resistance is inevitable, the executive should seek to counteract charges against change and line up support for it. The nurse executive also needs to determine the staff's position on proposed changes; the nearer the staff is to acceptance, the nearer the change will be to implementation. Some precautionary steps when implementing change include good communications, use of an independent change agent such as a resource person, and assuring staff of an evaluation process after the change is implemented.

HRP-0007769/3GA Not available NTIS
McGill Univ., Montreal (Quebec). Dept. of Epidemiology and Health.
Primary Care by a Nurse Practitioner in a Rural Clinic.
Robert Oseasohn, Martha Schweback, Betty Eberle, and Richard A. Reid. 1974, 5p
Contract PHS-HSM-110-69-241
Pub. in the American Jnl. of Nursing v75 n2 p267-271 Feb 75.

Descriptors: Statistical distributions, *Rural health services, Rural areas, Registered nurses, Projects, *Nurses, *New Mexico, Health resources, Health manpower, Health care, Health care services, *Health care delivery, Distribution, Demography, Communities.

The use of a nurse practitioner (NP) to provide health care to a rural New Mexico community with no physician is described. A staff nurse from the local hospital with varied experience as a school nurse, office nurse, and hospital nurse was hired as part of a health delivery project of the University of New Mexico. Her preparation for providing primary care began with a review of the tasks she would be expected to perform -- health check-ups for all ages, birth control services, antepartal and postpartal care, maintenance of the chronically ill, and care in case of acute illness or accident. Needs that could not be met locally were to be referred to urban medical centers. Additional information and skills needed were determined and a six-month training program was devised. As the training program evolved, a record system was designed to facilitate patient care and to permit subsequent assessment of the system of care. The clinic in Estancia was designed to be staffed only by the NP and a laboratory-aide receptionist who ran the office and performed laboratory procedures. Physicians supervised the medical care by the NP through written instruction and telephone. These supervisory physicians visited the clinic once a week to see patients referred by the NP. Analysis of the program revealed that the NP spent 33 percent of her time in direct patient contact and 20 percent in record keeping. A sample of records indicates that the nurse took 571 of 606 actions specifically requested by the physicians and took occasional unauthorized actions, usually in areas where protocol called for physician consultation.

HRP-0007776/8GA Not available NTIS
Indian Health Service, Rockville, Md. Dental Services Branch.
Children's Dental Program for American Indians.
Joseph Abramowitz. 1970, 11p
Pub. in Jnl. of the American Dental Association v81 p395-405 Aug 70.

Descriptors: United States, Public health, Health care services, Dentists, *Dental services.

The Public Health Service's dental health program for American Indians, Eskimos, and Aleuts is described as the prototype for a national dental health program for children. The program serves a population of 403,500 in the Indian Health Service and involves 250 reservations west of the Mississippi River and in Alaska. Most of the Indians are culturally isolated, live in abject poverty, and are unfamiliar with modern health theories and practices. The goal of the Indian dental health program is to elevate the oral health status of participants to the highest possible level. Dental clinics are located in hospitals, health centers, and health stations near the largest accessible populations. A system of age and service priorities is followed. Preschool children receive primary attention, followed by school children. Within service priorities, emergency care for all patients, regardless of age, takes precedence. Emphasis is placed on providing the most essential dental care for the age group with the highest priority. An incremental care program is carried out beginning with the youngest children. The Indian Health Service employs 138 dentists, each assisted by an average of 1.5 trained dental assistants. Most of these assistants are Indians. The program attempts to bring together potential dental trainees with specific needs of the Indian Health Service. Meaningful participation by the Indian people in the decision-making process enhances the effectiveness of the program.

HRP-0007778/4GA Not available NTIS
California Univ., San Francisco. School of Medicine.
Doctors' Attitudes Toward National Health Insurance.
Lee Goldman. 1974, 11p
Grant PHS-RM-00804
Pub. in Medical Care v12 n5 p413-423 May 74.

Descriptors: United States, Physicians, Legislation, Law(Jurisprudence), Health care delivery systems.

The opinions of Yale University School of Medicine's graduates and students concerning national health insurance proposals by the 92nd Congress are reported, based on a questionnaire mailed to a sample of members of each medical school class from 1930 to 1976. This survey attempted to avoid methodological problems of previous surveys by including a proportionate number of students, interns, and residents. Seven real and four hypothetical Congressional bills were constructed and respondents were asked to express attitudes toward each alternative. The American Medical Association bill, also known as the Medicredit Plan, was the only bill acceptable to an overall majority of respondents. The next most popular bill, supported by 37 percent of the respondents, was the Javits bill for national health insurance. Two of the most publicized proposals, the Kennedy - Griffiths Health Security Act and the Nixon Administration bill, appealed to 10 percent of the respondents. Medical students comprised the segment of respondents most likely to approve of radical changes in the medical care system. Medical school faculty members also tended to favor reform measures. Surgeons, solo practitioners, and young established doctors preferred more conservative legislation.

HRP-0007779/2GA Not available NTIS
Ottawa Univ. (Ontario).
Data Collection Requirements for Patient Management.
J. M. Last. 1970, 10p
Pub. in Medical Care v8 n4 p159-168 Jul-Aug 70.

Descriptors: Methodology, *Medical records, Health care, Foreign countries, Data processing, Data processing systems, Data collection, Data analysis, Data acquisition.

The efficiency of hospital discharge abstract systems in Great Britain is assessed. In Britain, the efficiency of abstract systems which provide information about bed usage to hospital administrators may be jeopardized by hospital procedure and organization. Case notes may be compiled by junior members of the clinical team, not the discharging officer, and thus records may be incomplete. A central clearinghouse which serves the entire country is considered necessary to operate a record linkage system effectively. The abstract must identify the patient, his condition, hospital, and required service. The abstract should omit no detail which establishes a patient's uniqueness. Clinical data should contain the following information: clinical status on admission, diagnostic data, procedures, bed usage, outcome, therapeutic information, and socioeconomic data. Each medical specialty needs separate in-

formation, and the abstract system must be capable of generating tables which can answer questions on patient management by divergent services. The precise nature and frequency of tabulations must be decided in consultation between clinicians and statisticians. A proposed abstract form is appended.

HRP-0007781/8GA Not available NTIS
Saint Augustine's Center for American Indians, Chicago, Ill.
Alcoholism, Illness, and Social Pathology Among American Indians in Transition.
Gerard Littman. Aug 69, 19p
Pub. in the American Jnl. of Public Health v60 n9 p1769-1787 Sep 70.

Descriptors: Therapy, Sociology, Socioeconomic status, Socioeconomic factors, Psychotherapy, Preventive medicine, Methodology, Illinois, Health care, Demography, Communities.

Alcoholism among American Indians is examined in the context of working experience at St. Augustine's Center for American Indians in Chicago. The study area is characterized by high rates of transiency, crime, mental illness, and unemployment. It is noted that alcoholism is the number one health problem among American Indians in general, not just those in urban ghetto settings. Alcoholism seems to flourish in poor socioeconomic conditions under which most Indians live. Between 20 and 25 percent of Indians suffer from psychiatric disorders and Indian death rates for automobile accidents and homicide are much higher than the national average. American Indians also suffer from divergent cultural attitudes concerning illness, treatment, and prevention. The American Indian personality is characterized by nondemonstrative emotionality and reserve; stoic and passive behavior is seen as a defense mechanism. Drinking by Indians is viewed as a means to relieve anxiety, repressed aggression, and pressures from acculturation. Drinking is also viewed as a means to promote group solidarity. A variety of drinking patterns exists among American Indians and it would be unrealistic to develop a single treatment modality. Most urban Indian alcoholics do not want to give up drinking for fear their lives may become even more unbearable. Several treatment and rehabilitation efforts are described.

HRP-0007820/4GA Not available NTIS
Pan American Health Organization, Washington, D.C. Sanitary Bureau.
Medical Auxiliaries.
1973, 66p
Available from the Washington Pan-American Health Organization, 525 23rd St. N.W., Washington, D.C. 20032, $2.50.

Descriptors: Rural health services, Rural areas, Physician extenders, Physician assistants, *Health resources, Health occupations, Health manpower, Health care utilization, Health care services, Foreign countries.

Proceedings of a symposium on medical auxiliaries, held during the June, 1973, meeting of the Pan American Health Organization Advisory Committee on Medical Research, are reported. Presentations on the following topics are included: auxiliaries in the health team; a review of current uses of medical auxiliaries in health delivery systems; the delivery of primary care by medical auxiliaries in rural villages in Guatemala; the control of neonatal tetanus in rural Haiti through the use of medical auxiliaries; training and use of dental auxiliaries in Jamaica; and utilization of auxiliary personnel to expand health services in rural areas. In the summarization of the seminar proceedings, it is noted that convincing arguments exist for the training and utilization of medical auxiliaries for both specific and generalist roles in diagnosis and treatment. It is suggested that the Pan American Health Organization sponsor and fund operational research to provide data on the use of medical auxiliaries in South American countries, and assist in promoting the training of auxiliary teachers. Transcriptions of the workshop discussions following each presentation are included.

HRP-0007830/3GA PC$3.50/MF$3.00
Michigan Univ., Ann Arbor. Dept. of Health Planning and Administration.
Impact of Federal Funds Altering Health Care.
Robert N. Grosse. Feb 75, 24p

Descriptors: Objectives, Methodology, Health resources, Health planning, Health economics, *Health care, Health care facilities, Health care delivery, Government policies, Forecasting, Financing, Economics, Economic theory, Cross impact.

Problems involved in understanding and attempting to predict the impact of expenditure of Federal funds on the health status of a specified target population are discussed as they relate to the development of models for improved resource allocation decision-making. A review of literature on the subject is included, and directions for future efforts are suggested. Examples of ways in which different models can yield different conclusions regarding the desirable configuration of resource allocations are cited. In particular, the complexities of the Federal Comprehensive Health Planning program and the problems that arise from these complexities are outlined. Three general factors contributing to the complexity of comprehensive health planning are identified: (1) the general and pervasive ignorance of the basic quantitative relationships in the health industry; (2) the multiplicity of actors in the health care system; and (3) the multiplicity of subsets of the population whose welfare is at stake. It is suggested that a need exists for a relevant information base, not only concerning needs and resources, but particularly concerning interrelationships, or 'production functions.' When the structural nature of the health care industry, i.e., the components and their interrelationships, is better understood, planning will be improved significantly. Examples are given of the kinds of information that would be useful in describing the characteristics and interrrelationships of the health services industry. Three classes of information useful in measuring the impact of Federal actions on health status are identified: (1) standards for and measures of the health status of a population; (2) information on changes in health status behavior, as produced by environment, and services; (3) information on identity and amount of resource costs and effects of Federal actions on health-related behavior, environment, and services.

HRP-0007853/3GA Not available NTIS
Pennsylvania Univ., Philadelphia. School of Medicine.
Comprehensive Health Centers in Large U.S. Cities.
A. Gerald Renthal. Feb 70, 13p
Pub. in American Jnl. of Public Health v61 n2 p324-336 Feb 71.

Descriptors: United States, Research, Health resources, Health care utilization, Health care services, Health care facilities, Health care delivery, Ambulatory health care.

The findings of a 1969 survey on the utilization of health department facilities for providing comprehensive health services are reported. Twenty-four of the 25 largest U.S. cities responded to the survey. Four departments have either planned or instituted comprehensive health centers on a citywide basis. Nine departments have either planned or instituted comprehensive health centers on a limited scale. Three departments have comprehensive service programs for restricted groups such as children and youth and also provide traditional preventive and categorical services. Eight departments provide only traditional preventive and categorical services. Health department facilities considered to be convertible to comprehensive centers exist in 12 of 20 departments that have not already moved toward citywide development of such centers. The development of comprehensive health centers by the health department was considered desirable by 14 health officers surveyed. Several health officers thought the provision of health services by alternative methods was preferable. The most prominent barriers in converting health department facilities to comprehensive care centers were found to be shortage of space, money, and personnel. Supporting tabular data are included.

HRP-0007856/8GA Not available NTIS
Harvard Medical School, Boston, Mass. Dept. of Preventive and Social Medicine.
How Effective Will National Health Insurance Be.
Osler L. Peterson. 1973, 11p
Pub. in the Annals of Internal Medicine v78 n5 p739-49 May 73.

Descriptors: Prepaid health care, Plans, Legislation, Law(Jurisprudence), Health resources, *Health insurance, Health care facilities, Health care delivery, Health care delivery systems, Financing.

Problems of the medical care system are discussed in relation to the effectiveness of national health insurance. The possible effects of major legislative plans on medical care are analyzed. Such effects range from further inflation of medical care prices to solutions for some of the more serious problems. All proposed legislation involves medical care insurance but not health insurance, and it is believed that health insurance will require far broader social action than is called for in any of the legislative plans on medical care. Features of major health insurance proposals are presented in tabular form, with emphasis on coverage, financing, benefits, administration, and standards. Four desirable characteristics of the medical care industry are examined: accessibility, quality, costs, and equitable financing of care. Primary consideration is given to accessibility and costs since these characteristics seem to underlie much of the present concern about medical care. It is hypothesized that most of the present legislative proposals will not ameliorate medical care problems; rather, some proposals will intensify the problems. It is further hypothesized that problems of the medical care delivery system lie as much in medical care organization as in payment mechanisms. Two types of evidence, historical and analytical, are used to support the hypotheses.

HRP-0007859/0GA Not available NTIS
Toronto Univ. (Ontario). Dept. of Behavioral Science.
Neighborhood Health Centers: Traditional Medical Care at an Outpost.
Peter Kong-ming New, and Richard M. Hessler. 1972, 14p
Contract PHS-HSM-110-69-255
Pub. in Inquiry v9 n4 p45-58 Dec 72.

Descriptors: United States, Standards, Reviewing, Research, Quality assurance, Public health, Private facilities, Participative management, National government, Methodology, Measurement, Management, Local government, Health resources, Health related organizations, Health related individuals, Health planning, Health occupations, Health manpower, Health care, Health care services, Health care facilities, *Health care delivery, Government agencies, Financing, Evaluation, Criteria, *Consumers, Community relations, Assessments, Agencies.

Discussions were held with providers and consumers of health services in about 12 neighborhood health centers throughout the United States to evaluate the care provided at such centers. The centers were of two types: (1) those which received a major portion of their financial support from OEO (Office of Economic Opportunity) and / or the Public Health Service; and (2) those supported purely by voluntary aid or by limited contributions from private sources. The centers were evaluated in terms of consumer participation (partnership relation between providers and consumers, information sharing, and budget control) and center staff members and their roles. It was determined that consumer participation is now built into the neighborhood health center. Those involved in the neighborhood health center network, it was noted, are determined to provide innovative health care rather than traditional services. However, the provision of innovative health care is considered to be a difficult task. Constraints involved in providing this type of care are discussed and an important issue is identified as the accountability of health care providers and consumers.

HRP-0007963/2GA Not available NTIS
Role of Hostility and Militancy in Indigenous Community Health Advisory Groups.
Mary L. Moore. 1971, 9p
Pub. in the American Jnl. of Public Health v61 n5 p922-30 May 71.

Descriptors: Personnel management, Participative management, Orientation(Training), Methodology, Management, Local government, *Health planning, Consumers, Community relations, Agencies.

Observations are presented from a study of five community health advisory groups in three Midwestern States. Four of the groups were composed of over 85 percent indigenous poor consumers of the health or welfare services offered by the agency being advised, and the fifth group was composed of 88 percent professionals and 12 percent residents of the target area. Participation-observation techniques were used during approximately 300 hours of group meetings. Tables present data for each group on sex, educational level, whether employed or receiving aid, average income, how group membership was attained, and average group attendence at meeting. The themes of hostility and militancy are tabulated according to concept and relationship being observed. Group controls are examined, as are examples and incidence of hostility and militancy. It was concluded that hostility and militancy contribute to the functional effectiveness and cohesiveness of local advisory groups composed of poor people, and the suggestion is made that the health professional needs to reassess his prototype of a successful meeting (ability of members to get along well with others, congeniality, nonagressive behavior) when applied to an indigenous health advisory group. Of the five groups, those who had more controls imposed on them by the professionals in the group, and group five, composed mainly of professionals, accomplished less than the groups exhibiting hostile, aggressive behavior.

HRP-0007964/8GA Not available NTIS
National Committee Against Mental Illness, Washington, D.C.
Impact of National Health Insurance on Delivery of Health Care.
Miek Gorman. 1971, 10p
Pub. in the American Jnl. of Public Health v61 n5 p962-971 May 71.

Descriptors: United States, Research, Prepaid health care, Health resources, *Health insurance, Health care facilities, *Health care delivery, Financing.

The problem of effecting change in our medical and health care system is discussed with particular emphasis on national health insurance, and the need to see beyond the financial aspects to the structural changes required for the effective delivery of quality care is stressed. A 1968 Blue Cross Association poll of more than 1000 persons nationwide revealed that most respondents, whether poor or affluent, felt themselves isolated from good medical care. Several proposals for national health insurance, emanating from such diverse sources as Blue Cross, the American Hospital Association, AFL-CIO, and members of Congress, are examined. The problem of separating national health insurance from private insurance carriers is discussed, with one authority noting: 'The insurors are part of the problem, not part of the solution.' One solution proposed involves a capitation system, paid partly from general Federal tax revenues and partly from employer and employee contributions; which would provide incentives for health care providers to contain costs by utilizing more ambulatory and preventive care and less hospitalization. Alternative delivery methods also are discussed.

HRP-0007976/7GA Not available NTIS
University of Southern California, Los Angeles. Dept. of Community Dentistry.
Consumer - Provider Conflict in Health Service Recommendations.
Clifton O. Dummett. 1973, 10p
Pub. in Health Services Reports v88 p795-803 Nov 73.

Descriptors: Safety engineering, Public health, Preventive medicine, Preventive dentistry, Methodology, Health resources, Health related organizations, Health related individuals, Health occupations, Health education, Health care technology, Health care services, Health care requirements, Dentists, *Dental services, *Consumers, Ailments.

The advantages and disadvantages of gold caps on anterior teeth are discussed. Reports were received by dentists in OEO (Office of Economic Opportunity) neighborhood health centers that patients from disadvantaged communities came to dental clinics requesting gold caps on their anterior teeth. A historical review on the use of gold caps is presented and attitudinal changes involved in the use of such procedures are noted. Characteristics of the disadvantaged are considered, along with the relationship between health services and cosmetology. A brief review on the use of gold shell crowns in the mouth and a summary of their effects on the periodontium are presented. Dental schools have denounced these appliances as inimical to the image of a health profession. Because there have been significant changes in patient attitudes toward the providers of general and oral health services, it is pointed out that many patients now feel that it is their right from a public health standpoint to demand and receive cosmetic services on parts of their anatomy to improve physical appearances as they view them. There are acceptable ways to resolve the provider-consumer conflict in this particular instance, and it is suggested that these should be used whenever necessary.

HRP-0008001/0GA Not available NTIS
Rand Corp., Santa Monica, Calif.
Normative Model of Medical Research Resource Allocation.
Emmett Keeler, and Joseph Newhouse. Jun 70, 22p RM-6108-1-RC
Available from the Rand Corp., 1700 Main St., Santa Monica, Calif. 90406, $1.50.

Descriptors: System analysis, Methodology, Mathematical models, Health care, Data processing, Data processing systems, Data analysis.

A normative model is developed for evaluating investments, particularly investments in biomedical research, that reduce the probability of sickness or death. The simple mathematical model of individuals' preferences proposed gives 'reasonable predictions' when asked qualitative questions. In lieu of obtaining sample data concerning consumer preferences with regard to bioresearch expenditures, the model is used to determine what biomedical research is worth to consumers. Application of the model in this manner leads to the conclusion that, in the field of biomedical research circa 1969, the probability of achieving future advances appears to be sufficiently low to warrant the conjecture that the Nation already is spending more for biomedical research than that research is worth to consumers. Conditions that would alter such a conclusion are noted. Mathematical equations accompany the text.

HRP-0008021/8GA PC$4.50
Northwest Indiana Comprehensive Health Planning Council, Inc., Highland.
LaPorte County Health Facilities and Services Study.
Peter W. Teitelman. Oct 75, 69p
Grant PHS-05-P-0000-09-05-0

Descriptors: Supplies, Statistical distributions, State regions, Reserves, Research, Methodology, Measurement, Inventories, Indiana, Health resources, Health planning, Health occupations, Health manpower, Health care, *Health care facilities, *Health care delivery, Distribution, Development, Demography, Data acquisition, Communities.

A survey of health facilities and services in LaPorte County, Indiana is presented by the Northwest Indiana Comprehensive Health Planning Council. LaPorte County contains a mixture of rural and urban populations, a large portion of which relies on industry for employment. The report includes the following: a population and health statu profile; description of health facilities and services (hospitals, nursing homes, county health department, Visiting Nurses Association, and other health agencies); examination of utilization trends for hospitals, emergency departments, nursing homes, and home care; information on health education and manpower resources; financial information; and bed need projections for hospitals and nursing homes. The following major conclusions are reached: (1) the live birth rate has been declining in LaPorte County since 1970; (2) nearly all major hospital services are duplicated in the county; (3) nursing homes and hospitals have built facilities in excess of community need and have experienced decline in occupancy levels; (4) shortages of health manpower, particularly primary care physicians and nurses, exist; (5) annual cost of health services is estimated at $28 million, or about $262 per capita; and (6) hospitals in LaPorte County, particularly in Michigan City, overutilize inpatient hospital services. Several alternative recommendations are presented and analyzed, including: taking no action, closing entire facilities, closing portions of facilities; developing alternative uses of existing facilities; sharing services, and merging facilities. A schedule for implementing the recommendations is provided. Supporting data and a bibliography are included.

HRP-0008047/3GA Not available NTIS
Mount Sinai Medical Center, New York. Doris Siegel Memorial Fund.
Medicine and Social Work - An Exploration in Interprofessionalism.
Helen Rehr. 1974, 127p
Available from Neale Watson Academic Publications, Inc., 156 Fifth Avenue, New York, 10010, $3.95.

Descriptors: State regions, Sociology, Socioeconomic status, Socioeconomic factors, Research, New York, Health resources, Health related organizations, Health related individuals, Health occupations, Health manpower, Health care, *Health care delivery, Demography, Communities.

A series of working papers on medicine and social work that emphasizes interprofessionalism is presented. The working papers were prepared under the auspices of a project established by the Doris Siegel Memorial Fund at the Mount Sinai Hospital in New York. The goal of the project was to establish a level of professional excellence in the encouragement and support of social work in an effort to enhance the social effectiveness of health and medical care. A conference or colloquium dealing with the development of interprofessional social and health delivery systems both in practice and in education was recommended during the course of the project. The following topics were addressed in three working papers prepared for the colloquium: developmental perspectives on interprofessional education, institutional constraints to interprofessional practice, and university education in interprofessional practice, and university education in interprofessional perspective. Issues involved in interprofessionalism were examined in a discussion session at the colloquium, and an agenda for the future of interprofessionalism was developed.

HRP-0008051/5GA Not available NTIS
New York State Dept. of Health, Albany.
Peer Review of Medical Care.
Fred Richardson. 1972, 11p
Pub. in Medical Care v10 n1 p29-38 Jan-Feb 72.

Descriptors: State regions, Reviewing, Quality assurance, Physicians, Peer groups, New York, Methodology, Measurement, Health occupations, *Health care.

Findings of an analysis of peer review judgments for a sample of surgical, pediatric, and obstetric patients treated in the hospitals of the Central New York Hospital Service Region are reported. Study findings revealed discrepancies in intra-disciplinary judgments of the quality of clinical care that cast doubt on the validity and the reliability of uncontrolled (i.e., subjective) peer judgments of the quality of care. It is demonstrated that the degree of agreement between repeat judgments on the same case by the same reviewer did not differ materially from agreement observed in a different study involving serial judgments of the same case made by different reviewers. It is shown: (1) that individual judges consistently differed in the degree of harshness or permissiveness of their judgments; (2) that judges depended upon different aspects of clinical care to make final judgments of the quality of that care; and (3) that the number of independent (but professionally equally qualified) judges required to reach a stable judgment of care quality exceeded the number logistically available to meet the probably future demands of third-party payers. It is suggested that judgments of the quality of clinical care, derived from retrospective analyses of hospital charts, should be related to the compliance (or noncompliance) of the recorded care with preestablished sets of standards for that care. Supporting data are included.

HRP-0008058/9GA Not available NTIS
Kentucky Univ., Lexington. Dept. of Family Practice.
Primary Medical Care Evaluation. The AAFP-UNC Collaborative Study.
James A. Burdette, Robert A. Babineau, Fitzhugh Mayo, Barbara S. Hulka, and John C. Cassel. 1974, 8p
Grant PHS-HB-00026
Pub. in Jnl. of the American Medical Association v230 n12 p1668-1673 Dec 23-30 74.

Descriptors: Surveys, Standards, Reviewing, Quality assurance, Plans, Physicians, Nurses, North Carolina, Methodology, Measurement, Indiana, Health occupations, Health care, *Health care delivery, Evaluation, Data collection, Data acquisition, Criteria, Assessments.

A study design to compare and evaluate different systems of primary medical care delivery in the United States is reported. The first step in the project involved the development of a classification of current systems of primary medical care and a comprehensive set of criteria for comparison and evaluation of these systems. Eight criteria were developed for assessment according to two categories: (1) medical management -- utilization, cost and convenience, physician performance, and outcome; and (2) physician-patient interaction -- communication, compliance, physician awareness of patient concerns about condition, and attitudes toward physician (patient satisfaction). Specific criteria which established eligibility in the study for each indicator condition noted in the above criteria were normal pregnancy, infancy, diabetes mellitus, and congestive heart failure. Fort Wayne, Indiana (Allen County) was selected as the study site. This urban area had a population of approximately 200,000, with all socioeconomic groups represented. The concept of an indicator case (common in all systems of primary care) was used as a convenient way to sample and evaluate medical care delivery. Data were collected by a trained group of nurse interviewers and very little physician time was required. A unique aspect of the study is that it was conceived and worked out in detail over a five-year period cooperatively by a group of practicing physicians representing the American Academy of Family Physicians and experienced medical researchers from the School of Public Health of the University of North Carolina.

HRP-0008060/6GA Not available NTIS
Executive Office of the President, Washington, D.C.
Measures of Health System Effectiveness.
Arnold H. Packer, and Gordon D. Shellard. 21 Dec 68, 4p
Pub. in Operations Research v18 n6 p1067-1070 Nov-Dec 70.

Descriptors: System analysis, Quality assurance, Methodology, Measurement, Mathematical models, Health care, Data processing, Data processing systems, Data analysis.

A set of measures for evaluating the effectiveness of a health system is proposed. An earlier measure of the ineffectiveness of a health system in which the system is viewed first from the perspective of an individual and then from that of an entire community was used in developing the new set of effectiveness measures which take into account interaction effects that may occur between a health care system and the individuals it is designed to serve. For example, the effect of the saturation of scarce medical resources when the number of cases to be treated exceeds some threshold value may be expressed mathematically within the framework of the model upon which the measures of effectiveness are based. The saturation factor might be important in the provision of health services to the poor when lengthy lines may discourage an individual from seeking needed treatment or in the case of large-scale epidemics. Insight into the measures described is provided by applying them to determining the effect of adding family planning services to a health care system. Mathematical notations are accompanied by explanatory text.

HRP-0008063/0GA Not available NTIS
Rural Mental Health Delivery System: Four Corners Community Mental Health Center - Price, Utah.
1975, 4p
Pub. in Hospital and Community Psychiatry v26 n10 p671-674 Oct 75.

Descriptors: Utah, State regions, Rural areas, Projects, *Mental health care, Health care services, Health care delivery.

The establishment and first three years of operation of a community mental health service center serving the residents of four sparsely populated rural counties in southeastern Utah are described. The Four Corners Community Mental Health Center serves some 42,000 persons living in small towns or on isolated farms, ranches, or Indian reservations through two central offices, nine satellite clinics, and a psychiatric wing in a local general hospital. The Center uses extensive outreach activities, inservice training, school programs, and alliances with other agencies. Funded by Federal, State, and county grants, the Center has 39 staff members, including one psychiatrist, two psychologists, six social workers, four psychiatric social workers; seven nurses, five Navajo outreach workers, four Chicano outreach workers, eight clerical staff, two mental health aides, and one volunteer coordinator-public relations worker. The Center also uses 250 volunteers recruited from the community. Whenever possible, the Four Corners staff brings its services to the residents of the counties, covering the territory in four-wheel-drive vehicles. The services provided by the center are summarized, and special problems encountered in attempting to provide mental health services to the Native American population are discussed. Photographs accompany the article.

HRP-0008188/9GA PC$4.00
Young (Arthur) and Co., Washington, D.C.
Public Accountability: Tools and Techniques to Improve Public Accountability in Comprehensive Health Planning Agencies.
Thomas F. Lantry. 24 Jun 74, 28p
Contract PHS-HSM-110-73-516

Descriptors: State regions, Public relations, Methodology, Management, Legislation, Law(Jurisprudence), Health resources, Health related organizations, Health planning, Health care delivery systems, *Comprehensive health planning, *CHP(Comprehensive Health Planning), Arizona, Agencies.

Legislation existing or pending as of June, 1974, relative to public accountability requirements for councils and boards of comprehensive health planning (CHP) agencies is reviewed, and techniques for achieving better public accountability are described. Elements of public accountability addressed relate to the securing of new members, processing of member applications, and analysis of board membership. Specific tools described and illustrated include: membership information, membership application forms, supplemental information form, monitor of board profile form, and community profile. Sample forms are those developed for the Comprehensive Health Planning Council of Maricopa County, Phoenix, Arizona. It is noted that, in addition to the aspects of public accountability discussed, consideration should also be given by CHPs to public education, sensitivity to problems of the disadvantaged, assumption of responsibility for agency decisions, and a high degree of staff commitment. Portions of this document are not fully legible.

HRP-0008210/7GA Not available NTIS
Social Security Administration, Washington, D.C.

Financing the Care of the Mentally Ill under Medicare and Medicaid.
Dorothy P. Rice, Ruth I. Knee, and Margaret Conwell. 1970, 16p
Pub. in the American Jnl. of Public Health v60 n12 p2235-2250 Dec 70.

Descriptors: United States, *Mental health care, Health resources, Health care utilization, Health care services, Health care facilities, Health care delivery, Financing.

The impact of Medicare and Medicaid on the care of poor and mentally ill, aged persons is assessed. Medicare and Medicaid have been in effect since 1967. Although psychiatric patients of all ages constitute a very small proportion of the total general hospital population, an increase is discernible in the utilization of Medicare and Medicaid facilities by aged psychiatric patients. A significant number of mental hospitals in the United States participate in the Medicare program. Special Medicare limitations applicable to aged patients in mental hospitals, however, resulted in payments amounting to only $25 million over a one-year period(1969). Federal payments to mental hospitals under Medicaid, on the other hand, were considerably greater, amounting to $135 million. Medicare has become a major resource for financing the care of aged persons with psychiatric illnesses in general hospitals, while Medicaid has become a major resource for payment for the care of elderly patients in mental hospitals. Several States have already supported specific gains in the care and treatment of the elderly in mental institutions but there is considerable variation among the States in implementing mental illness provisions of the Medicaid program. A continued decrease in the mental hospital resident population rate for individuals aged 65 years and over has been observed, although the influence of medical assistance or Medicare payments on this decrease has not been evaluated. It is felt that Medicare and Medicaid are significant in the improvement of care for elderly psychiatric patients, coupled with the development of clinic services and community mental health centers.

HRP-0008228/9GA Not available NTIS
Notre Dame Univ., Ind.
Mental Hospitals: A Study in Organizational Effectiveness.
Clagett G. Smith, and James A. King. 1975, 199p
Available from D.C. Health and Co., 125 Spring St., Lexington, Mass., 02173, $16.00.

Descriptors: United States, Quality assurance, Patients, Organization theory, Methodology, Mental health, Measurement, Inpatients, *Health resources, Health related organizations, Health care, Health care services, Health care facilities.

A study on the organizational effectiveness of mental hospitals is reported. The book represents a program of research carried out at the Center for Advanced Study in Organizational Science at the University of Wisconsin; the Department of Sociology and Anthropology at the University of Notre Dame; and the Department of Sociology and Anthropology at the University of Toledo. Emphasis in the study is placed on an organizational analysis of factors conducive to mental hospital effectiveness. A national sample of State mental hospitals was studied, with particular attention paid to the organizational and administrative aspects of hospital functioning. The plan and procedures of the study are described. A model of organizational functioning is presented which may be useful for the study of a multiple-goal organization such as the mental hospital. Special emphasis is placed on the concept of organizational effectiveness and on means for assessing the contributions of a complex series of factors to such effectiveness. Hospital effectiveness measures and control procedures are described, along with the work environment of the professional and nursing staff of mental hospitals. Communication and coordination aspects of mental hospital organization are discussed. Hospital organization is examined in terms of its goals, structure, administration, decision-making, and change. The hospital ward environment is also examined, and the mental hospital is viewed as an integrated but complex organization. A systems framework is presented, within the context of organizational functioning and performance, to describe the flow of events characterizing the operation of a mental hospital.

HRP-0008233/9GA Not available NTIS
Johns Hopkins Univ., Baltimore, Md.
Health Economics: An Introduction.
Alan L. Sorkin. 1975, 218p
Available from D.C. Heath and Co., Dept. H.S., 125 Spring St., Lexington, Mass. 02173, $12.00.

Descriptors: United States, Health resources, Health occupations, Health manpower, *Health economics, Health care, Health care facilities, Health care delivery, Health care costs, Foreign countries, Financing, Economics.

The economics of the health services industry are discussed in a textbook designed to meet the needs of undergraduates as well as students enrolled in schools of public health and other medical institutions. Emphasis is on health economics in the United States; however, approximately one-fourth of the material focuses on health problems in developing countries. The opening chapter describes the economic characteristics of the health service industry, as well as recent trends in expenditures and costs of medical services in the United States. Subsequent chapters comprise: an analysis of the demand for health services, including an evaluation of several empirical studies; discussion of the physician shortage and utilization of health auxiliaries in developed and developing countries; a presentation of the major reasons for the acceleration in hospital cost inflation; examples of cost-benefit and cost-effectiveness analysis as applied in developed and developing nations; a discussion of the interrelationships among health, population and economic development in poor countries; an examination of the relationships between health and poverty; observations on the federally funded Neighborhood Health Centers and health programs for American Indians; and a discussion of the private health insurance industry as well as proposals for public health insurance. Supporting data and an index are provided.

HRP-0008249/5GA Not available NTIS
Veterans Administration Hospital, San Francisco, Calif.
Physician's Assistants and Clinical Algorithms in Health Care Delivery: A Case Study.
Gerald Charles, David H. Stimson, Michael D. Maurier, and John C. Good. Sep 74, 7p
Pub. in Annals of Internal Medicine v81 n6 p733-739 Dec 74.

Descriptors: Research, Physicians, Physician extenders, *Physician assistants, Health occupations, Health manpower, Health care utilization, Health care technology, Health care services, Health care delivery, Diagnosis, Ambulatory health care.

An experiment in which physician assistants (PAs) used clinical algorithms when seeing outpatients in a large teaching hospital is evaluated. During a three-month program, PAs were trained to use the clinical algorithms, which are step-by-step instructions for solving clinical problems. Utilization of the algorithms over a two-year period was then evaluated. The evaluation revealed that: (1) clinical algorithms can be used to deal effectively with most presenting complaints of patients in a drop-in clinic; (2) clinical algorithms allow control over the use of institutional resources; (3) PAs can be trained quickly to use clinical algorithms; (4) prior collection of patient data by PAs reduces the amount of time physicians spend with patients; (5) PAs collect and record significantly more data than do physicians; and (6) patients readily accept PAs. Effective use of PAs and clinical algorithms was hampered by problems involving professional roles, organizational structure, and managerial ability. The evaluation methodology is described in detail, and implications of the findings are discussed. A schematic illustration of the clinical algorithm for complaints of back or neck pain is included.

HRP-0008254/5GA Not available NTIS
Gateways Hospital and Community Mental Health Center, Los Angeles, Calif.
Program Evaluation: Alcohol, Drug Abuse, and Mental Health Services.
Jack Zusman, and Cecil R. Wurster. 1975, 290p
Available from D.C. Heath and Co., Dept. H.S., 125 Spring St., Lexington, Mass. 02173, $14.00.

Descriptors: United States, Standards, Reviewing, Quality assurance, Methodology, Measurement, Health care delivery, Evaluation, Criteria, Assessments.

Reports, comments, and impressions from authorities in the areas of evaluation of alcohol, drug abuse, and mental health service programs are presented as the outgrowth of a conference on Evaluation of Alcohol, Drug Abuse, and Mental Health Services Programs. Discussions concerning evaluation theory and the state of the art provide the basis for an overview of recent evaluation research and techniques. Evaluation in practice is described for various community research applications. Some practical applications of evaluation techniques discussed concern: a California five-county cost-effectiveness study; a National Institute of Mental Health cost-effectiveness methodology for developing patient services as a community mental health center; and development of a community assessment strategy within the context of a community mental health program. Program evaluation capability based on site visits provides a criteria for assessing current applications of evaluation techniques. Federal evaluation of project performance, and outcome measurement. Current issues in evaluation include: the responsibilities and rights of the evaluator, evaluation in relation to policy and administration, and training for evaluators.

HRP-0008284/4GA PC$6.00/MF$3.00
Missouri Nurses' Association, Jefferson City.
Missouri Nurses' Survey.
Missouri Nurses Survey: A Statewide Survey of Professional Nursing Supply and Needs, 1975.
Randall W. Meyer. Sep 75, 144p

Descriptors: Statistical distributions, Registered nurses, *Nurses, *Missouri, Health resources, Health occupations, Health manpower, Health manpower education, Health education, Health care, *Health care requirements, Distribution, Demography, Communities.

A study of statewide professional nursing supply and needs is reported by the Missouri Nurses' Association. Data were obtained from a review of the literature and surveys of health care institutions and agencies employing registered nurses (RNs), all Missouri schools of nursing, and a 20 percent sample of licensed RNs in Missouri. Data are presented detailing the institutional characteristics and employment practices and needs of health care institutions and agencies which employ RNs. RN posi-

tions, salaries, inservice training, continuing education, budgeted and unfilled positions, and educational levels in these institutions and agencies are detailed in tabular form. The individual characteristics of Missouri nurses are described, including educational preparation, marital status, age, employment settings, hours worked, and salary. An inventory of the types, curriculum, size, and location of schools of nursing is provided. This inventory includes basic preparation programs, continuing education activities, and postgraduate degree programs; it discusses student admissions, withdrawals, and graduates. Projected needs of the schools of nursing are related to the needs of employers of nurses and of individual nurses. Recommendations are offered to resolve problems of nursing need, demand, and supply. Survey instruments are appended.

HRP-0008267/7GA PC$8.00/MF$3.00
Minnesota Systems Research, Inc., Minneapolis.
Macro-Statistical Model of the Health Sector for the State of Minnesota. Volume II: Technical Report.
Feb 73, 238p
Volume I is available as HRP-0004508.

Descriptors: System analysis, Strategy, Specialists, Registered nurses, Physicians, Nurses, Nurse aids, *Minnesota, Methodology, Medical personnel, Mathematical models, Licensed practical nurses, Health planning, Health occupations, *Health manpower, Health care, Health care requirements, Forecasting, Data processing, Data processing systems, Data analysis, Allied health personnel.

A macro-econometric planning model, developed under the auspices of the Comprehensive Health Planning Program, Minnesota State Planning Agency, is presented. The model consists of a health services block and a health manpower block. The health service blocks contains the following components: voluntary short-term general hospitals; State and local governmental short-term general hospitals; licensed nursing homes; licensed boarding care homes; outpatient departments of non-federal hospitals (separate models of emergency room and specialty clinic visits); home health care programs; primary care physician offices (including general practitioners, internists, pediatricians, obstetricians, and family practitioners); and secondary care physician offices. The health manpower blocks includes the following components and subcomponents: nurses, including registered nurses, licensed practical nurses, nurse anesthetists, nurse aides and orderlies, and surgical technicians; therapy rehabilitation manpower, including registered physical therapists, physical therapy technicians, registered occupational therapists, and occupational therapy assistants; clinical laboratory manpower; medical records manpower; and miscellaneous health personnel. The model provides a method for analyzing the interdependencies and relationships of the health care delivery and health manpower components. The report includes a review of the literature on health care delivery and manpower planning models; a description of data sources and data gathering efforts relative to the development of the Minnesota model; a description of the conceptual model; application of the model to an analysis of the Minnesota health sector; a discussion of uses of the model in projecting future health manpower requirements; and recommendations for future research activities. Supporting data are included.

HRP-0008268/5GA Not available NTIS
Harvard Univ., Cambridge, Mass. Graduate School of Business Administration.
Organizational Issues in Health Care Management.
Alan Sheldon. 1975, 354p
Available from Spectrum Publications, Inc., 8619 Sancho St., Holliswood, N.Y. 11423, $17.95.

Descriptors: United States, Strategy, Organization theory, Methodology, Health resources, *Health related organizations, Health planning, *Health care services.

Case studies of managerial situations drawn from a variety of health institutions are presented to illustrate organizational issues in health care management. The purpose of the case studies is to illustrate current theory and techniques which will give managers some ideas on how to approach the organizational issues involved in health care. The case studies are presented under six chapter headings: (1) responsibility and role of managers; (2) managerial values and organizational motivation with emphasis on the peer review problem; (3) organization structure and operating mechanisms; (4) use of groups as a management tool; (5) stability, change, and adaptation in organizations; and (6) leadership (style and tasks). A bibliography is provided.

HRP-0008271/9GA Not available NTIS
Conference Board, Inc., New York.
Health-Care Issues for Industry.
Seymour Lusterman. 1974, 99p
Available from the Conference Board, 845 Third Ave., New York, N.Y. 10022, $17.50 (Non-associate), $3.50 (Associate or Educational).

Descriptors: Profit, Private organizations, Private institutions, *Health resources, Health related organizations.

Proceedings of one-day conference, sponsored in April 1974 by The Conference Board in cooperation with the Alcoa Foundation, the Commonwealth Fund, and the Rockefeller Brothers Fund, are reported. The conference, attended by over 200 senior industry executives, health professionals, and government representatives, was held to examine the stake of industry in a more effectively structured and equitable health delivery system, and to explore ways in which industry might support efforts toward that end. In the keynote address, the basic problems of the health care system are explored, and implications for business policy are noted. Edited transcripts are included for presentations and discussions on the following topics: enlarging the company role in employee health care; determining the cost effectiveness of occupational health programs; a labor view of company medical roles; implications of the Occupational Safety and Health Act for company health services; business and the changing health care scene; business relationships with community health agencies; company organization for community health relations; controlling hospital costs; and roles for business in Health Maintenance Organization (HMO) development. Relative to the last two subjects, the experiences of Motorola, Inc., in tackling problems related to hospital costs affecting its Phoenix, Arizona, employees, and of General Mills, Inc., in the development of an HMO project in the Twin Cities (Minnesota) area are described.

HRP-0008273/5GA Not available NTIS
De Paul Univ., Chicago, Ill.
Working With Others for Patient Care. Edition Number Two.
Grace G. Peterson. 1973, 173p
Available from the Wm. C. Brown Co., 2460 Kerper Blvd., Dubuque, Iowa 52001, $2.95.

Descriptors: Registered nurses, *Nurses, Health resources, Health occupations, Health manpower, *Health manpower education, Health education.

As an aid to professional nursing students and to newly-graduated professional nurses in learning to work with others to give quality nursing care, various conceptual aspects of the team approach to health care are discussed, with emphasis on the identification of principles as guides to action. The book attempts to define the role of the hospital in society and in patient care; the organizational structure of the hospital and its role in patient care, with emphasis on the concept of staff and line; the role of the health team and nursing team in patient care; and the role of the nurse as a member or leader of the nursing team. Principles in working with others are identified from the perspective of a nursing student or general duty nurse responsible only for her own duties, as well as from the perspective of the leader who is responsible for the work of others. The nurse responsible only for her own assignment has three different roles in the work situation: one with the team leader, one with peers, and one with subordinates. The team leader also has three roles: one with the head nurse, one with other team leaders, and one with subordinates. Principles are identified for each of these roles. The potential usefulness of the text in hospital inservice educational programs directed toward preparation of professional nurses to serve as team leaders is pointed out. A bibliography and an index are provided.

HRP-0008275/4GA Not available NTIS
Lund Univ. (Sweden).
Managing the Community Hospital: Systems Analysis of a Swedish Hospital.
Eric Rhenman. 1973, 314p
This book was translated from the Swedish by Julie Sundqvist.
Available from D.C. Heath and Co., Dept. H.S., 125 Spring St., Lexington, Mass. 02173, $16.00.

Descriptors: System analysis, Quality assurance, Physicians, Nurses, Methodology, Measurement, Health occupations, Health manpower, Health care, Health care facilities, Foreign countries, Evaluation, Data processing, Data analysis.

A case study of a Swedish community hospital, performed by a group of researchers in organizational development, is documented. The report comprises a systems analysis of the hospital from a business administration point of view, and describes environmental demands and medical problems as determinants of administrative problems. A general discussion of the hospital as a controlled production system and a description of the study methodology are followed by individual chapters describing the hospital's participant relations, the hospital's production system, administration of the hospital's participant groups, and administration of the hospital's production. Among the findings and recommendations are: (1) department heads, as individuals and collectively, are more active than hospital management (i.e., board of trustees) in taking the initiative for change and making decisions; (2) hospital management (board of trustees, chief of medical staff, and hospital director) should be given more responsibility and freedom of action; (3) the 17 clinical departments in the hospital studied should be combined into four clinical 'blocs,' each headed by a bloc chief, appointed for a limited period of time, who would have significant administrative powers but limited medical duties; and (4) the bloc chief should be given resources reflecting the amount and quality of care performed in the bloc and should be primarily responsible for adequate staffing in the bloc. In addition, the following suggestions were made: (1) uneven 'loads' at the hospital and limited interchangeability of personnel require creation of greater flexibility; (2) a mobile personnel reserve of physicians and nurses should be established; (3) patients should have greater opportunities to complain; and (4) a physician should be hired to act as pa-

tient ombudsman. Supporting data, organization flow charts, and a bibliography are included.

HRP-0008289/1GA Not available NTIS
American Hospital Association, Chicago, Ill.
Changing Hospital Economy.
David F. Drake, and Kenneth E. Raske. 1974, 7p
Pub. in Hospitals, Jnl. of the American Hospital Association v48 p34-40 16 Nov 74.

Descriptors: Patients, Inpatients, *Health economics, Health care, *Health care costs, Economics, Economic theory, Ambulatory health care.

An analysis of recent experiences relating to the changing economy of hospitals is presented which indicates that demand considerations are no longer primary reasons for hospital cost inflation. The growth of a hospital's economy has been explained historically by increasing demand induced by third-party insurance coverage and rising income levels. However, increased prices for goods and services hospitals consume currently dictate a hospital's economy. Characterized as cost-push inflation, the syndrome is considered to be primarily external to the hospital industry. The identification of cost-push inflation is examined in a relation to its public policy implications. Because the prices hospitals pay are beyond their direct control, an attempt to impose wage-price guidelines or to reimpose wage-price controls on the industry will have little effect on hospital inflation. Hospital inflation will only be contained when economy-wide inflation, specifically inflation in markets from which hospitals purchase goods and services, decelerates. With the advent of national health insurance and a surge in demand for health care, particularly for ambulatory care, inflation where both demand - pull and cost-push forces simultaneously surface must be averted. Phasing in of benefits and appropriate government support for acquiring needed hospital resources are two strategies which should be considered. The full impact of cost-push inflation can be somewhat reduced through increased efficiency of hospital operations. Government can assist by alleviating current regulatory initiatives that detract from efficiency and by eliminating internal inconsistencies in existing regulations.

HRP-0008521/7GA Not available NTIS
Beth Israel Hospital, Boston, Mass.
Study of Peer Review of Inhospital Patient Care.
Jacob Fine, and Mildred A. Morehead. 1971, 11p
Contract PH-110-68-30
Pub. in New York State Jnl. of Medicine v71 n8 p1963-1973 15 Aug 71.

Descriptors: Reviewing, Quality assurance, Peer groups, New York, Methodology, Measurement, *Health care.

A project undertaken to evaluate the usefulness of a peer review manual developed by the Medical Society of the State of New York is documented. The manual contains instructions on the general purposes of review, advice on organization of a system for internal review, an explanation of the role of the manual in the review, and review patterns appropriate for the care of six common disorders: acute appendicitis, fibroid uterus, prostatic hypertrophy, acute myocardial infarction, diabetes mellitus, and cerebral vascular accident. The project, in which records of 150 patients with specific discharge diagnoses from six hospitals were evaluated by six physicians aided by the manual, was designed: to assess the review patterns as aids in rating medical care, to analyze the effects of certain variables on the quality of care in the institutions studied, and to identify the nature and extent of deficiencies in various aspects of medical care. The medical examiners unanimously found the review patterns to be a substantial aid. Conclusions drawn from the data gathered from the participating hospitals include: (1) the teaching hospital is clearly superior to other hospitals in overall quality of professional care; (2) in community hospitals, a 'good deal' of substandard physician performance is found; (3) approval for a training program in a nonteaching hospital does not assure better clinical performance; (4) superficial assessment of the patient and loose standards of practice are major reasons for inferior care; (5) the method of review employed in the project is a practical one for general adoption by hospitals; (6) review patterns are essential for continuous or periodic review of a whole institution, if not for review of individual records; (7) external as well as internal review is necessary if bias is to be held to a minimum; and (8) the nonexpert preferably should not be used in the review process. Supporting data are included.

HRP-0008523/3GA Not available NTIS
Chattanooga-Hamilton County Health Dept., Tenn.
Chattanooga's Experience with Reorganization for Delivery of Health Services.
M. M. Young. 1970, 9p
Pub. in the American Jnl. of Public Health v60 n9 p1739-1748 Sep 70.

Descriptors: Tennessee, State regions, State government, Projects, Organization theory, Local government, Health resources, Health related organizations, Health care services, *Health care delivery, Government agencies.

Experiences of Chattanooga's City-County Health Department in community reorganization for the delivery of health and other community services and participation in a number of federally financed programs are described. A Community Action Program was initiated under OEO (Office of Economic Opportunity) sponsorship and, with an initial OEO grant of $200,000 for the first year, Chattanooga's health department employed additional public health nurses, licensed practical nurses, sanitarians, a health educator, statistician, medical social worker, and an equal number of indigenous nonprofessionals who were residents of the area to be served. At the time of program implementation, the Division of Nursing within the health department changed its organization from an individual nursing concept to the team nursing concept in order to function more effectively and deliver more services. By utilizing aides in a variety of functions, the health department was able to expand greatly needed services. Other programs initiated by the Chattanooga City - County Health Department are discussed, including the Alton Park Neighborhood Health Center, Head Start program, Pilot Cities Program, and the Model Cities Program. Organization charts for the Community Action Program and for neighborhood services organization are provided. Problems and accomplishments associated with Chattanooga's planning for comprehensive service delivery are noted.

HRP-0008531/6GA PC$4.00/MF$3.00
Atlanta Regional Commission, Ga.
ARC Health Manpower Planning Model: Version HT.
Technical Memorandum
Fredric D. Kennedy. Feb 72, 39p ARC-HP-72-1
This is a working paper.

Descriptors: System analysis, State regions, Methodology, Medical personnel, Measurement, Mathematical models, Health occupations, *Health manpower, Health care, Health care utilization, Health care requirements, Georgia, Data processing, Data processing systems, Data analysis, Computer software.

A technical description is presented of the health manpower planning model developed by the Atlanta Regional Commission. The ARC model (version HT) estimates personnel in 13 health categories needed in a hospital setting. These categories are in five basic hospital functions: nursing, pharmacy, physical therapy, clinical laboratory, and radiology. Physicians needed for house staff have been omitted because the complexity of their operations has not been adequately modelled to allow similar estimates. Five factors are considered in the estimate of manpower needs: (1) demand for services, (2) care requirements, (3) personnel performance, (4) personnel utilization, and (5) hospital size effects on the other four factors. Demand for services, determined by numbers of hospital admissions and number of patient days for each hospital size category, is input to the model. Care requirements are defined by the average number of basic work units required by each patient, e.g., the average number of pharmacy orders. Personnel performance is the measure of time required to perform a given work unit. Personnel utilization indicates the allocation among manpower categories of total man-hours required, and converts the allocated man-hours into personnel equivalents. The development of the model, and its computer implementation, are described in detail. Examples of model uses (e.g., determining the effects on required manpower of variation in admissions, distribution of patients, variation in manpower mix, or introduction of automation) are given. Supporting data and computer materials are included, together with operation instructions for implementation of the model.

HRP-0008546/4GA PC$4.50/MF$3.00
Harvard School of Public Health, Boston, Mass. Dept. of Maternal and Child Health.
Family Health Care: A Study of Its Meaning in Practice.
William M. Schmidt, and Helen D. Cohn. 31 Jul 72, 70p
Grant PHS-MC-R-250119-01-0

Descriptors: Urban health, Urban areas, United States, Research, Organization theory, Health resources, Health related organizations, *Health care services, Health care delivery, Ambulatory health care.

A study of ten neighborhood health centers in cities across the Nation, undertaken to identify and describe characteristic elements of facilities whose services are described as family-oriented, is documented. The study involved a review of 367 family records to measure the extent to which family members were seen by the physician in the course of one year; interviews with project directors and staff members to obtain their opinions and concepts concerning family health care and the procedures adopted for implementation of such care; observations of patients at the time of enrollment; and attendance at team meetings in eight centers. The programs visited were found to possess a number of attributes which to some degree predicate care of individuals upon consideration of family members of their households. To a lesser extent, the programs attempt to organize the care of family members on an inclusive basis, regarding the family as a unit. Illustrations of the limited application of the concept of 'family health care' are presented, indicating that the concept is freely used to describe practices which in reality are limited in reaching all family members. The need for improved staff training in delivery of family health care and for better operating procedures, such as more functional family health care records and more systematic team practice, is discussed. Supporting data are included.

HRP-0008547/2GA PC$4.00/MF$3.00
National Center for Health Services Research and Development, Rockville, Md.

Occupational Licensure and Health Care: A Survey of the Literature.
1971, 38p

Descriptors: Regulations, Quality assurance, Physicians, Methodology, Medical personnel, *Licenses, Legislation, Law(Jurisprudence), Health occupations, Health manpower, *Health care, Health care delivery systems, Credentials, Certification.

Literature relating to the impact of occupational licensure on the productivity of the health sector and to the policy issues raised by licensure is reviewed. The review draws on writings by economists, physicians, public health specialists, historians, lawyers, and others, dating through 1971. Included are discussions of: the causes of licensure in general; licensure, certification, and information; the issues of medical care quality; results of licensing in the medical care market, including supply restriction and substitution, discrimination, impact on medical education, prevention of competition within the profession, competition and mobility among occupations and specialties, and geographic mobility restrictions; and policy alternatives. A list of 44 references and supporting tabular data accompany the text. Portions of this document are not fully legible.

HRP-0008803/9GA Not available NTIS
Tel Aviv Univ. (Israel). Dept. of Nursing.
Opinion on Nursing.
Rebecca Bergman, Rebecca Adams Stockler, and Zeev Gilad. 1971, 30p
Pub. in International Nursing Review v18 n3 p195-230 1971.

Descriptors: Surveys, Registered nurses, Physicians, Nurses, Methodology, Health resources, Health occupations, Health manpower, Health manpower education, Health education, Health care, Foreign countries, Data processing systems, Data collection, Data acquisition.

A study undertaken by the Tel Aviv University Division of Nursing to investigate the attitudes and opinions of medical and nursing students concerning nursing functions, nursing education, and status of nurses is documented. The study, initiated in 1969, involved a survey of three groups of medical students from the Tel-Aviv University Medical School (first, third, and sixth year) and two groups (first and third year) of nursing students from each of three schools -- a total of 313 respondents. The survey instrument included sections on: personal variables of respondents; spontaneous word associations with nursing; 30 activities to be classified as above, within, or below the scope of the registered nurse; indication of the status of nurses as compared with 13 other professions and occupations; and opinion concerning the length of program in nursing education, and the existing and desirable educational requirement for entrance to nursing. Study findings with regard to the above sections are analyzed in detail relative to the following hypotheses: (1) medical students' opinion of nursing will become less favorable during the clinical years of study; (2) nursing students' opinion of nursing will be influenced by selected factors in the school situation; (3) students with close relationships to nurses will tend to have opinions at the extremes of the scale; (4) students' opinions will be related to characteristics such as social class, country of birth, age, sex, etc.; and (5) a planned educational experience for medical students on nursing will improve opinions on nursing. French, German, and Spanish summaries are provided. Tabular data are included. A copy of the survey instrument is not provided.

HRP-0008802/8GA Not available NTIS
Nursing Audit: New Yardstick for Patient Care.
Charlotte Isler. 1974, 6p
Pub. in RN Magazine v37 n12 p31-35 Dec 74.

Descriptors: State regions, Reviewing, Registered nurses, Quality assurance, Peer groups, Nurses, Michigan, Methodology, Measurement, Health occupations, Health care.

The audit procedure used by nurses at the University of Michigan Medical Center, Ann Arbor, Michigan, is described. The Medical Center nursing staff uses an audit model that places emphasis on nursing functions including psychosocial aspects of care, as opposed to task and procedure orientation. Each clinical area of the Center is represented by one or more nurses, appointed for a one-year period, on an audit committee. Each month the closed charts of some 100 discharged patients (about five percent of the total discharged) are selected at random for audit. Each auditor completes from nine to 11 charts within three weeks. Each audit set consists of three parts: (1) general information to be provided by the ward clerk; (2) documentation and scoring of the performance of 50 subcomponents of seven nursing functions (application and execution of physician's legal orders, observation of symptoms and reactions, supervision of the patient, supervision of those participating in care, reporting and recording, application and execution of nursing procedures and techniques, and promotion of total health by direction and teaching); and (3) interpretation of scores and recording of results. The committee then reviews the audit results and prepares a summary report, which contains a statistical summary of the number of charts audited and of various patient data, as well as comments on the quality of the audit entries. Benefits of the nursing audit are discussed, and audit sheets and evaluation forms are illustrated.

HRP-0008804/7GA PC$3.50/MF$3.00
Health Planning Authority of Region VII, Elkins, W. Va.
Profile of Region VII. Volume I.
1970, 24p
Volumes II and III are available as HRP-0008805 and HRP-0008806. These volumes contain a regional health plan and strategies for implementing standards developed in the plan.

Descriptors: West Virginia, Vital statistics, State regions, Physicians, Mortality, Indexes(Ratios), Health status indexes, Health resources, Health occupations, Health manpower, Health care, *Health care requirements, Health care indexes, Health care facilities, Fertility, Dentists, Demography, Communities.

A description of West Virginia Planning and Development Region VII is provided in a tabular format. General population data are presented by county, followed by population projections and an assessment of economic status by county. The demand for physician and dental services is indicated by a sample of the average number of physician and dental visits. Standard birthrate and mortality statistics are used to indicate a demand for services. Other tabular data include: facilities summary by hospital, patient flow information, comparative analyses of hospital services, physician supply, county accident summary, ambulance services, EMS communications, mental health and mental retardation services, and primary care service areas.

HRP-0008805/4GA PC$3.50/MF$3.00
Health Planning Authority of Region VII, Elkins, W. Va.
Standards for the Development of Treatment Centered Health Services. Volume II.
1970, 18p
Volumes I and III are available as HRP-0008804 and HRP-0008806.

Descriptors: West Virginia, Systems, State regions, State government, Plans, Patients, Objectives, Methodology, Long term care, Local government, Inpatients, Health planning, Health care services, Health care requirements, *Health care delivery, Health care delivery systems, Government policies, Emergency medical services, Development, Data acquisition, Ambulatory health care.

A regional health plan to provide accessible and effective personal health services to Region VII of West Virginia is presented. The plan addresses treatment-centered services which are provided to an individual in response to one or more symptoms of illness or disability. Treatment-centered services are offered on three levels: (1) primary care services are the first services provided in response to symptoms of illness; (2) secondary services are services to which and individual is referred when primary services are insufficient; and (3) tertiary health services are those to which an individual is referred when secondary services are inadequate. The provision of services within each of these levels is discussed. Because there is no market area in Region VII with a sufficient population base to provide tertiary care services, the Health Planning Authority will not support application for provision or replacement of such services. Availability and project standards are provided for the other two levels of care based on an inventory presented in another document. The following priorities for personal health services have been adopted: development of outpatient health services, regional development of emergency services, development of home health services, and development of long-term care facility for the aged. Implementation strategies are suggested in Volume III.

HRP-0008806/2GA PC$3.50/MF$3.00
Health Planning Authority of Region VII, Elkins, W. Va.
Improving Health Service Delivery in Region VII. Volume III.
1970, 13p
Volumes I and II are available as HRP-0008804 and HRP-0008805.

Descriptors: West Virginia, State regions, Standards, Reviewing, Projects, Methodology, Health care, Evaluation, Criteria, Comments, Assessments.

Strategies are suggested for implementing treatment-centered health service standards formulated in a regional health plan for Region VII of West Virginia. The review process of the Health Planning Authority of Region VII is outlined. Criteria are proposed for: determining if a project meets a community need, locating a project, evaluating staffing patterns, evaluating efficiency and productivity, and evaluating economic feasibility. A nonprofit corporation has been formed to assist communities in the region in providing primary care services. The functions and activities of this corporation are described. Objectives adopted to assure an adequate number of qualified health professionals are outlined, including establishment of an areawide health education center. Program recommendations are provided for group treatment homes. Policy guidelines for secondary care services are included.

HRP-0008860/9GA PC$6.75/MF$3.00
Hospital Educational Foundation of California, Inc., Sacramento.
Medical-Management Audit of Hospital Emergency Departments.
Final Rept.
Oct 75, 152p

Descriptors: Surveys, Research, Quality assurance, Methodology, Measurement, Health resources, Health care, Health care facilities,

Health care delivery, Evaluation, *Emergency medical services, Data processing systems, Data collection, Data acquisition, California.

The development and application of a survey guide designed to gather audit data from hospital emergency medical facilities are documented. Under contract with the California Regional Medical Program, the California Hospital Association's Hospital Education Foundation initiated in 1974 an 18-month project involving a survey of 319 out of 581 acute general hospitals in California. On-site audits were conducted in 197 of the hospitals by teams consisting of physician, nursing, administrative, and paramedical personnel. An additional 122 hospitals responded by mail to questionnaires. Data were coded and analyzed, resulting in 18 tables presented in the report. In addition to the data, the report presents details of the study methodology, classification criteria for emergency medical facilities and services, a tabular comparison of three methods for categorizing emergency services in hospitals, copies of the survey guide and revised survey guide developed in the study, lists of participating interviewers and hospitals, and a bibliography. Recommendations address the need for updated information, coded surveys for access to data processing, multidisciplinary survey teams, continuing education for hospital emergency service personnel, and utilization by planners and evaluators of the data gathered in the survey as well as the methodology developed.

HRP-0008954/6GA PC$6.00/MF$3.00
Operations Research, Inc., Silver Spring, Md.
Design of Health Training Program Retrieval Modules for the Bureau of Health Manpower Education, Institutional Profile Program.
31 Dec 72, 135p
Contract PHS-72-4346

Descriptors: Universities, Surveys, Schools, Questionnaires, Methodology, Medical education, Health resources, Health related organizations, *Health manpower education, Health education, Health care, Design, Data processing systems, Data collection, Data acquisition.

The development of questionnaire components to be used by the Bureau of Health Manpower Education, DHEW, in a survey of institutions conducting health training programs is documented. The survey will provide the primary source of data for an institutional profile system, which will support the various functions of the Bureau by providing information in an economical and systematic fashion. The report describes the following activities: determination of information modules and data elements; program definition and development of criteria for inclusion of a program in a survey (e.g., program control, type of occupation, length of program, status of program operations, program objective, and award level of program); and question development, including questionnaire review, field interviews, mail pretest, and analysis of pretest results. The final product of the study is a set of 83 questions that can be used for surveying health training programs conducted at various institutions. The questions are applicable to both educational and noneducational institutions conducting training programs. Comments on potential problems which be encountered in collecting a given data element accompany the questions, and alternative question designs are presented where applicable.

HRP-0008955/7GA Not available NTIS
Ibadan Univ. (Nigeria).
Impact of Public Health Services on Mortality: A Study of Mortality Differentials in a Rural Area of Nigeria.
I. O. Orubuloye, and J. C. Caldwell. 1975, 14p
Pub. in Population Studies v29 n2 p259-72 Jul 75.

Descriptors: Vital statistics, *Rural health services, Rural areas, Research, *Mortality, Health care, *Health care services, Health care delivery, Foreign countries, Demography, Communities.

Mortality statistics are compared for two villages in the Ekiti Division of Nigeria's Western State to determine the impact of improved medical facilities on mortality. Both villages were essentially farming settlements; neither had grid-articulated electricity or pipe-borne water. The first, Ido, had a general hospital with one physician and 11 nurses and trained midwives. The village also had two trained health workers and eight shops selling pharmaceutical goods. In contrast, the nearest hospital to the second village, Isinbode, was 40 km away. A maternity center and a pharmaceutical shop were located 10 km, in opposite directions, from Isinbode. Every two weeks, a 'medical hawker' brought patent medicines for sale to Isinbode. Ido, in 1963, had a population of 17,637, and Isinbode had 4,295 inhabitants. The study involved a survey of 600 individuals concerning their health-related behavior. The great difference between the two villages in the treatment of illness was found to reflect the ready access of one population to modern health facilities not easily available to the other, rather than any contrast in attitudes to the proper treatment of sickness. The difference was found to be greatest in the care of children, especially infants. A comparison of mortality levels for the infants and children of the two villages reflects the differences in availability of medical care noted in the survey. The findings lead to the conclusion that continued mortality decline is not a matter of overcoming ignorance but of providing a sufficient density of health services of reasonable caliber.

HRP-0008969/8GA Not available NTIS
Thomas Jefferson Univ., Philadelphia, Pa. Dept. of Community Health and Preventive Medicine.
Poor: Their Medical Needs and the Health Services Available to Them.
Mary W. Herman. 1971, 10p
Pub. in the Annals of the American Academy of Political and Social Science v399 p12-21 Jan 72.

Descriptors: Urban health, Urban areas, United States, Sociology, Socioeconomic status, Socioeconomic factors, Patients, Inpatients, Health resources, Health care, *Health care services, Health care facilities, Demography, Communities, Ambulatory health care, Acute care.

The availability of health services for the poor is discussed in the context of higher disease and mortality rates and fewer physician and dentist visits for poor and minority groups. Data from the National Health Survey reveal that private physicians constitute the major source of ambulatory care for the poor as for the rest of the population. The poor, however, are limited in their choice of physician by geography and transportation, as well as by money. The private physician does not always provide entry into and coordination of care with the broader health care system; the care the private physician provides may be inadequate. In urban areas, public clinics and emergency services are a second major source of care for the poor. The structured and bureaucratic organization of most clinics usually results in episodic and fragmented treatment of the immediate problem and neglect of the social aspect of the illness. Neighborhood Health Centers involve consumers in policy-making and demonstrate that, when economic barriers are removed and services made convenient and attractive, the service will be used. Hospitalized poor patients admitted to ward service without the sponsorship of a private physician are exposed to staff attitudes which, together with aspects of the system itself, may result in a lack of concern for the patient's feelings. It is concluded that health services for the poor suffer from depersonalization, disorganization, and inadequate emphasis on health counseling or preventive care.

HRP-0008973/0GA Not available NTIS
New York City Health Services Administration.
Challenge of Health Services for the Poor.
Irving Levenson. 1971, 8p
Pub. in the Annals of the American Academy of Political and Social Science v399 p22-29 Jan 72.

Descriptors: United States, Sociology, *Socioeconomic status, Socioeconomic factors, Health status indexes, Health care, Demography, Communities.

Socioeconomic factors associated with poverty are discussed as major causes of the low health levels of the poor. Differences in well-being depend not only on income, but on such factors as health, security, and environment, all of which are depressed by low incomes. While a policy of equal access to health care cannot eliminate fundamental socioeconomic conditions, it can provide medical solutions to health problems. Health indexes of the poor have failed to show improvement when greater expenditures than for middle income groups are made; this may indicate significant differences in quality of care between the two groups. The use of interns and residents as an interim resource to provide primary care to the poor is proposed. Some major decisions concerning levels of insurance coverage and distribution of benefits must be made before a national policy toward health care financing is formulated. Problems of coordinating the financing of health services with the financing of other services must be met and the impact of health care financing on inflation must be examined.

HRP-0008990/4GA Not available NTIS
Deaconess Hospital, Evansville, Ind. Dept. of Nursing.
Administering Nursing Service.
Marie DiVincenti. 1972, 330p
Available from Majors Scientific Books, Inc., 3770 Zip Industries Blvd., Atlanta, Ga., 30354, $11.95.

Descriptors: Registered nurses, Personnel management, *Nursing, Nurses, Health resources, Health planning, Health occupations, Health manpower, Health care services, Agencies.

Concepts associated with the administration of nursing service are examined. Nursing service administration is primarily concerned with making its share of hospital organization effective through the process of management. While nursing administration is involved in managing a number of activities within hospitals, the patient is considered to be the primary reason for the existence of nursing service. The work of a nurse director is governed by her concept of administering nursing service, her recognition of its potential, and her respect for its unique position of leadership. An overview of trends in the delivery of health care in hospitals is presented which stresses the importance of sound nursing leadership in meeting patient needs. Consideration is given to the function and responsibilities of nurse directors, to the concept of management, and to how the nursing department related to total hospital organization. Specific managerial tools such as budgeting, staffing, job organization and appraisal, and staff education programs are discussed, along with hospital and nursing service philosophies. Information is provided on the nursing unit, safety, and supplies and equipment in relation to the establishment and maintenance of the physical environment by

nursing service personnel. The human environment is also addressed in terms of communication, morale, discipline, unions, and future management trends. Appendices provide samples of hospital philosophies, budgets, personnel evaluation forms, and other information considered useful in the administration of nursing service.

HRP-0008998/7GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
Factors Affecting the Effective Introduction of Mid-Level Health Workers.
Edward Cohen. May 74, 19p
This document is part of the Health Manpower Policy Discussion Paper Series.
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48104, $.50.

Descriptors: Registered nurses, Physicians, Physician extenders, Physician assistants, Nurses, Health resources, Health occupations, Health manpower, *Health care utilization, Dentists.

Impediments to greater utilization of mid-level health workers (e.g., physicians' assistants and nurse practitioners) are identified and assessed. One such impediment is the view of the health consumer, as influenced by understanding of the mid-level health worker concept and of its implications for quality of care, costs, and access. The second impediment involves the attitudes of health professionals, including physicians, dentists, registered nurses, and the mid-level health workers and potential mid-level workers themselves. Consideration here is given to economic effects, power and status perceptions, and genuine concern for the public good. Provider agencies, health insurance agencies, health profession educators, and governmental agencies are discussed with a view toward their potential for encouraging or discouraging more effective utilization of mid-level health workers. Emphasis is placed on the obligation of government to support the mid-level health worker concept.

HRP-0008999/5GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
Efficiency of Federal Subsidies to Medical Education.
George E. Wright. Apr 74, 25p
This document is part of the Health Manpower Policy Discussion Paper Series.
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48104, $.50.

Descriptors: Universities, United States, Students, Schools, Physicians, *National government, Health occupations, Health manpower education, Health education, Financing.

The efficiency of the system of public funding of medical education as of spring 1974 is analyzed within the framework of the three objectives constituting the most commonly stated justification for public support: (1) increasing the production of physicians, (2) improving their geographic and specialty distribution, and (3) increasing the enrollments of low income and minority students. Analysis of statistics indicative of the efficiency of public subsidy in fulfilling these objectives leads to the conclusion that existing means of public support are inefficient and expensive methods of meeting public purposes, and that enactment of the 1971 Comprehensive Health Manpower Act apparently has increased the inefficiency. It is noted that medical education, at a cost of $60,000 for four years, is an expensive proposition, but that public subsidies are even more expensive. The Health Resources Administration alone pays $86,000 in new subsidies for each new graduate above previous capacity, $20,000 in construction grants for each additional physician practicing in a physician-poor State, and $9,000 in student aid for each additional minority or low income graduate. Each additional physician from a low income family practicing in an underserved State costs $113,000 in additional subsidies. When increases in other Federal programs, State appropriations, and local government grants are added, the burden of subsidies is multiplied. It is suggested that Congress and State legislatures should begin to consider other mechanisms for meeting the social goals which underlie public support for medical education. These alternative approaches include not only broad shifts in emphasis away from high cost manpower to lower cost mid-level health workers, but also changes in the amounts and, more particularly in the type of subsidies granted to medical education. Supporting data are included.

HRP-0009002/7GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
Preliminary Evaluation of Federal Dental Manpower Subsidy Program.
Paul J. Feldstein. Jan 74, 33p
This document is part of the Health Manpower Policy Discussion Paper Series.
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48104, $.50.

Descriptors: Universities, United States, Students, Schools, Physician extenders, Physician assistants, Health occupations, *Health manpower education, Health education, Financing, Dentists.

The impact of Federal manpower programs on dentistry is examined, the primary beneficiaries under dental manpower subsidy programs are identified, and policy alternatives are suggested. The Federal manpower programs to increase the supply of dentists include student financial assistant programs and construction and institutional support programs for dental schools. As of 1971, the Federal subsidy program to dental schools and students had cost $310 million and was expected to continue at an annual cost of $58 million. Following the observation that an alternative to producing more dentists exists in a program to increase the productivity of existing dentists, it is observed that the reason behind the failure to consider alternative supply subsidy programs is that the use of a dentist-to-population ratio technique for estimating shortages precludes consideration of alternative policies. The use of health manpower-population ratios as a basis for public policy is discussed in general. The analysis presented involves a simulation of the impact of existing Federal subsidies on the dental sector and a similar simulation of the effects of subsidizing the number of dental auxiliaries. Comparison of the results indicates that subsidizing an increase in the number of auxiliaries (by reimbursing dentists for the auxiliaries' entire annual wage) could produce an equivalent increase in dental visits at less than one-tenth the cost of the dentist subsidy program as it existed in early 1974. It is further concluded that, if the goal is to achieve an increase in dental care for selected population groups or for the entire population, then dentist-population ratios are a poor indicator for policy. Supporting data are included.

HRP-0009007/8GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
Restrictive Licensing of Dental Paraprofessionals.
Owen E. MacBride. Mar 74, 38p
This document is part of the Health Manpower Policy Discussion Paper Series.
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48104, $.50.

Descriptors: United States, Quality assurance, Physician extenders, Physician assistants, Methodology, Medical personnel, *Licenses, Legislation, Law(Jurisprudence), Health occupations, Health manpower, Health care, Health care delivery systems, Credentials, Certification.

In a discussion of the licensing restrictions on dental auxiliaries, the shortcomings of the licensing system as of March 1974 are pointed out, and approaches to correcting these shortcomings are suggested. A licensing system, it is observed, is a restraint on competition imposed by the State in hopes of achieving certain benefits. However, by defining the limits of particular professions and trades to include only certain practices, licensing may inhibit the development of new techniques and skills. In addition, vesting control of the licensing authority in representatives of the professional group may subordinate the general consideration of the public interest to consideration of monopolistic group advantage. It is suggested that the system of legal restrictions on dental auxiliaries has led to both of these abuses. Two explanations are offered for the failure of dental boards to allow for the broad expansion of functions by auxiliaries, despite the statutory power invested in these boards to do so. One is resistance to innovation built into the board by the statutes establishing them. The second explanation lies in the economic self-interests of the board members and of dentists in general. Two possible bases exist for judicial attack by dental paraprofessionals upon the licensing system: due process and antitrust. Although judicial attack may hold some possibilities for reform, it is suggested that significantly more effective dental auxiliary licensing systems could be achieved with a few statutory changes, such as the elimination of all statutory serial listing of prohibited or permitted dental auxiliary functions. It is further suggested that strict guidelines are needed which would give courts a clear basis for determining when a licensing board has exceeded the scope of it authority. It is concluded that greater judicial activism is needed to eliminate licensing system abuses, and that statutory changes are needed to eliminate the causes of abuses.

HRP-0009083/7GA Not available NTIS
Committee on Government Operations (U.S. Senate). Permanent Subcommittee on Investigations.
Indian Health Care.
16 Sep 74, 271p
Available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, $2.55.

Descriptors: United States, Statistical distributions, Sociology, Socioeconomic status, Socioeconomic factors, Patients, Inpatients, Health resources, Health occupations, Health manpower, *Health care, Health care requirements, Demography, Communities, Ambulatory health care.

Witness statements on the quality of Indian health care are reported that were presented before the Permanent Subcommittee on Investigations of the Senate Committee on Government Operations in September 1974. The following individuals presented statements: Assistant Counsel for the Permanent Subcommittee on Investigations, Chairman of the Tonkawa Tribe of Indians of Oklahoma, Director of the Indian Health Service, Executive Director of the Navajo Health Authority, member of a Navajo Tribal Council, and an investigator of the Permanent Subcommittee on Investigations. Exhibits to the witness statements are provided which illustrate health care

needs among American Indians, and include: a study of the Indian Health Service and Indian tribal involvement in health; litigation involving the Indian Health Service in the Navajo Area; data supporting the FY 1975 Indian Health Service budget; sanitation facilities construction needs for the Navajo and Phoenix areas; report suspect typhoid cases; engineering reports concerning the Indian Health Facility at Winslow, Arizona; evidence regarding a shortage of nurses and health equipment; and a memorandum relating to deficiencies at Shiprock Hospital.

HRP-0009176/9GA Not available NTIS
California State Dept. of Public Health, Berkeley. Human Population Lab.
Personal Follow-Up in a Mail Survey: Its Contribution and Its Cost.
Joseph R. Hochstim, and Demetrios A. Athanasopoulos. 1970, 13p
Grant PHS-CH-00076
Pub. in Public Opinion Quarterly v34 n1 p69-81 1970.

Descriptors: Surveys, Methodology, Health care, Data processing systems, *Data collection, Data acquisition, California.

The mail questionnaire survey technique with personal follow-up is investigated in terms of its effectiveness in data collection. Mail returns from a sample of adults in California were examined. Three waves of mail response were obtained, followed by a personal retrieval wave. In total, 70 percent of the sample responded by mail, and personal contacts secured responses from another 16 percent. A comparison between mail response and total response and between each of these groups and the total sample showed that the two response groups were similar. Personal contacts improved response estimates for minority groups and for groups characterized by certain related socioeconomic descriptors at a per-respondent cost over twice that of the mail response. At the same time, personally retrieved questionnaires raised some response rates, particularly those of categories easy to find at home, above actual distributions. It was concluded that surveys conducted entirely by mail can achieve a good representation of the universe. However, when parameters are not known, a careful evaluation should be made of differences in response to substantive data by various socioeconomic and other relevant groups in a sample to see whether a bias in the total return would exist if such groups were over-reported or under-reported. In any mail survey, every effort should be made to establish parameters against which to evaluate mail returns.

HRP-0009188/4GA Not available NTIS
Genesee Hospital, Rochester, N.Y. Health Services Research Center.
Study of Consumer Attitudes About Health Care: The Delivery of Ambulatory Services.
William C. Stratmann. 1975, 12p
Pub. in Medical Care v13 p537-548 Jul 75.

Descriptors: State regions, Research, New York, Methodology, Measurement, Health care, Health care utilization, Health care delivery, *Ambulatory health care.

A study of consumer attitudes concerning the delivery of ambulatory services is reported. Consideration was given in the study to patient decisions in selecting a particular source of care, theoretical aspects of this choice process, and the results of a survey conducted to test the choice concept among residents of Rochester, New York. A questionnaire was used to obtain information from respondents. Each respondent ranked his choice of health care facility and satisfaction derived therefrom on a 10-point scale. A simple algorithm was later used to calculate a person's evaluation of health care facilities. Cluster sampling in the Rochester, New York area yielded a total sample of 437 households. Reasons for choosing a particular health care facility were categorized as follows: economic, temporal, convenience, sociopsychological, and care quality factors. A rationality model was developed to relate decision-making components for respondents with patterns of health care facility utilization and to examine the relationship between decision points and selected sociodemographic characteristics. It was concluded that the utilization of health services is a function of patient satisfaction with those aspects of care that matter to him and, consequently, that patient reaction to the care process is an essential measure of the merit of any given health care delivery system.

HRP-0009298/1GA PC$6.75/MF$3.00
Coastal Area Planning and Development Commission, Brunswick, Ga. Comprehensive Health Planning.
Health Care Delivery System Survey of the Chatham County Area.
Jeffrey B. Morris, and Mildred C. Waters. Nov 75, 166p

Descriptors: Surveys, Statistical distributions, State regions, Methodology, *Health resources, Health manpower, Health care, Health care facilities, Georgia, Distribution, Demography, Data processing systems, Data collection, Data acquisition, Communities.

Results of a survey of health providers in the Chatham County (Savannah), Georgia area are reported. The primary purpose of the survey was to describe the health care delivery system in the Chatham County area; a secondary purpose was to provide data for a health information system being developed on a regional level. Three survey questionnaires were used to inventory community health agencies, community physicians, and local hospitals. Results of each inventory are presented separately. The health care delivery agencies and the services they offer are identified, followed by summaries of the activities, funding, and services of each agency. Personnel in health-related agencies, sources of support, and financial data are described in tabular form. Recommendations are included. The physician inventory follows the same format as the community health agency inventory; it contains a list of physicians and office personnel and presents information concerning physician distribution. In the community hospital inventory, patient referral areas are defined on maps and utilization data are presented in tabular form. Related maps and tables are appended, as are the survey instruments.

HRP-0009299/9GA PC$4.00/MF$3.00
Coastal Area Planning and Development Commission, Brunswick, Ga. Comprehensive Health Planning.
Inventory of Hospital Facilities, Manpower and Patient Referral Patterns.
Nov 75, 36p

Descriptors: Strategy, State regions, Registered nurses, Nurses, Nurse aids, Methodology, Licensed practical nurses, Legislation, Law(Jurisprudence), *Health resources, Health planning, Health occupations, Health manpower, Health care facilities, Health care delivery systems, Georgia, Allied health personnel.

An inventory of hospital facilities, hospital manpower, and patient referral areas in a 24-county area of southeast Georgia is reported. The study area is contiguous to a health service area established under the National Health Planning and Resources Development Act of 1974 (P.L. 93-641). Inventory data were collected during 1974 and focus on the utilization of 21 area hospitals. A map is provided that is based on patient origin data for these hospitals. Inventory data on utilization, manpower, and demography are analyzed according to the map with regard to areas viewed as being more advantageous for health planning than other governmental boundaries or jurisdictions. In the reporting and analysis of hospital facilities data, two important calculations are made: occupancy rate, and average length of stay. These data are considered to be most important in reflecting the fiscal stability of hospitals in the study area. It is felt that hospital manpower data are useful in the development of educational programs. Included in the manpower inventory is information on the number of full-time employees, part-time employees, and vacant positions open at the 21 Georgia hospitals. Inventory data are presented in tabular form, and analytical terms used in preparing the inventory are defined.

HRP-0009370/8GA PC$5.00/MF$3.00
New England Board of Higher Education, Wellesley, Mass.
Higher Cost of a Higher Education: New England Trends 1970-1975.
Robert L. Melican, and Jeffrey L. Weinstein. 1975, 80p

Descriptors: Vermont, Rhode Island, Regions(United States), New Hampshire, Massachusetts, Maine, Health occupations, *Health education, Costs, Connecticut.

The costs of providing higher education to students in the New England region are examined. Reasons for higher student costs in New England than in other parts of the country are analyzed in terms of tuition and required fees, room and board charges, and other expenses. In an analysis of total costs for 173 institutions in the region, it was found that the total costs of a student's attendance have risen at a more rapid rate for public institutions, 35 percent, than private institutions, which rose 25 percent. Projections are presented for costs to 1978, taking inflation into account. Tuition and fees represent 62 percent of educational expenditures for private colleges and universities and 33 percent for public colleges and universities. Average tuition at private institutions is $2,233, which represents an annual increase of 8 percent. Public instate tuition averages $436 annually and out-of-State tuition averages $1,072, an increase of 45 and 41 percent respectively over a five-year period. Room and board constitutes an estimated 31 percent of the cost of attending a private institution and varies from 37 to 50 percent at a public institution. Not only are there variations in room and board expenses between institutions, but between States. All data are illustrated graphically. Appendices contain the Carnegie Classification for institutions of higher education.

HRP-0010274/9GA Not available NTIS
Health Resources Administration, Rockville, Md.
Membership on the Governing Body of a Health Systems Agency.
Orientation Handbook
1975, 16p DHEW/HRA-76/14014
Available from Technical Publications Branch, BHPRD/HRA, Federal Bldg. 3C-14, 9000 Rockville Pike, Bethesda, Md. 20014, free.

Descriptors: United States, Personnel management, Orientation(Training), Methodology, Legislation, Law(Jurisprudence), HSA(Health Systems Agencies), *Health systems agencies, Health resources, Health related organizations, Health planning, Health occupations, Health care delivery systems, Agencies.

A brochure designed to acquaint Governing Body members with the aims and purposes of Health Systems Agencies (HSAs) is presented. HSAs were created under the 1974 National

Health Planning and Resources Development Act, and the concept is based on the belief that all elements in the health care system should work cooperatively. The primary responsibilities and activities of a Health System Agency are outlined, and the staff requirements of an HSA are described. Regulations governing the designations of HSAs are delineated, as is the composition of the Governing Body. Training and information under the Act are considered, including technical assistance from DHEW and consumer involvement. A reading list is included.

HRP-0010431/5GA Not available NTIS
Michigan Univ., Ann Arbor.
Impact of the Development of Community Mental Health Centers on the Utilization of State and County Mental Health Hospitals.
Eduardo Nestor Siguel. 1974, 186p
Available from University Microfilms International, 300 N. Zeeb Road, Ann Arbor, Michigan 48106, $20.00.

Descriptors: United States, Patients, Mental health care, Long term care, Inpatients, *Health care utilization, Health care facilities.

Results are reported of a study to determine the impact that community mental health centers (CMHCs) have on the utilization of mental health facilities, particularly State and County Mental Health Hospitals (SCMHH). A multivariate step-wise regression analysis is used for 1970 and 1971 data from the 48 continental States to determine the functional relationship between SCMHH utilization and the development of CMHCs. SCMHH utilization is measured by resident rate at the end of the fiscal year, admissions rate, total patient days divided by the State population, and the average length of stay. CMHC development is measured by total personnel hours, total expenditures, and number of months in operation. Analyses of the State data reveal that: (1) a higher ratio of CMHCs per capita is associated with a lower SCMHH admissions rate; (2) States with newer CMHCs or larger expenditures for CMHCs tend to have lower SCMHH admissions rates; (3) higher expenditures or higher personal hours per capita for CMHCs are associated with lower SCMHH resident rates and a lower average length of stay; and (4) larger geographical areas and higher per capita incomes are associated with lower resident rates and a lower average length of stay, while higher State population is associated with higher resident rate and a higher average length of stay.

HRP-0010448/9GA Not available NTIS
Ohio State Univ., Columbus.
Process Appraisal of Comprehensive Health Planning at the State Level.
William Joseph Waters. 1975, 281p
Available from University Microfilms International, 300 N. Zeeb Road, Ann Arbor, Michigan 48106, $20.00.

Descriptors: United States, Strategy, State government, Standards, Reviewing, Objectives, Methodology, Local government, Health resources, Health related organizations, Health planning, Health care, Government policies, Government agencies, Evaluation, Criteria, *Comprehensive health planning, Assessments.

A set of evaluative criteria is developed to assess the comprehensive health planning process, and the extent to which comprehensive health planning (CHP) agencies are in compliance with these criteria is measured. A conceptual statement on the process of comprehensive health planning is derived from a review of literature. In this statement, the five fundamental steps in the planning process are identified as: task design, system investigation, ends establishment, means selection, and intervention evaluation. The conceptual statement of the planning process is compared with the practice of comprehensive health planning at the State level. A questionnaire was mailed to all 50 State CHP agencies to determine organizational and institutional characteristics. In addition, a case study of one State CHP was conducted to compliment the survey. It was found that the concept of the comprehensive health planning process described above is arbitrary, and continued refinement of the concept is necessary. A review and comparison of survey and case study results indicate a number of common problems: State CHP agencies do not appear to be engaged in technical analysis to any great extent; CHP agency activities lack precision; and State agencies are not setting overall goals. Both the survey and the case study indicate that State CHPs take a categorical or patchwork approach to planning activities. The survey instrument is included.

HRP-0010465/3GA Not available NTIS
North Carolina Univ. at Chapel Hill. Dept. of Public Health Education.
Black Rural Church: Its Role and Potential in Community Health Organization and Action.
John Wesley Hatch. 1974, 224p
Available from University Microfilms International, 300 N. Zeeb Road, Ann Arbor, Michigan 48106, $20.00.

Descriptors: State regions, Sociology, Socioeconomic status, Socioeconomic factors, Rural areas, Research, North Carolina, Minority groups, Methodology, Management, Health planning, Health care, Health care services, Demography, Community relations, Communities, Agencies.

Several aspects of the black church in North Carolina are examined, particularly the potential of black churches for health-related community organization. Following a descriptive review and analysis of the black church and the social needs it fills, 30 Baptist churches in Warren and Vance Counties are examined. Data were collected in interviews with ministers, association officers, undertakers, community outreach workers, and long-time residents of the area. The churches were arranged in a theoretical continuum ranging from sect-like traditional, through transitional, to assimilated. Two churches from each type of organization received more intensive study. Sociodemographic information was obtained from a questionnaire administered to members of the six churches. The major finding of the study was that persons in high status church roles were more active in community organizations outside the church than were members in lower or middle-level status roles. The occupants of both high status church and secular roles have nearly twice the income level and are nearly twice as likely to own their own homes as the average black resident of the community. The contribution of the results of this study to community action and social change among poor, rural blacks is limited by two considerations: the smallness of the sample and universe; and the fact that women emerged as more influential and powerful in the church than hypothesized.

HRP-0010511/4GA Not available NTIS
American Nurses' Association Inc., Kansas City, Mo.
Educational Preparation for Nurse Practitioners and Assistants to Nurses. A Position Paper.
1965, 16p
Available from American Nurses' Association, 2420 Pershing Rd., Kansas City, Mo. 64108, $.65.

Descriptors: Regulations, Registered nurses, Quality assurance, Private organizations, Private institutions, Physician extenders, Physician assistants, *Nurses, *Nurse aids, Methodology, Medical personnel, Licenses, Health resources, Health related organizations, Health occupations, Health manpower, *Health manpower education, Health education, Health care, Health care delivery systems, Credentials, Certification.

Educational programs for professional nurses, nurse practitioners, and assistants to nurses are addressed in a position paper prepared by the American Nurses' Association. Major activities of the association include promoting sound licensing legislation for nurses, assisting in the development of licensing examinations, setting standards for professional nurse registries and for organized nursing services, conducting surveys and studies of nursing service and nursing education, and helping nurses improve their practice through institutes, meetings, publications, and conventions. The position paper assumes that education for those in the health professions must increase in depth and breadth as scientific knowledge expands. It is also assumed that consideration must be given to the nature of nursing practice, means for improving nursing practice, education necessary for such practice, and standards for membership in the American Nurses' Association. The position is taken that education for all those who are licensed to practice nursing, including nurse practitioners and assistants to nurses, should take place in institutions of higher education. The minimum preparation for beginning professional nursing practice should be a baccalaureate degree education in nursing, while the minimum preparation for beginning technical nursing practice should be an associate degree education in nursing. Education for assistants in health service occupations should involve short, intensive preservice programs in vocational educational institutions rather than on-the-job training programs. The rationale behind the position taken by the American Nurses' Association is explained, along with implications of that position for nursing education, nursing practice, nursing service, and the training of auxiliary workers. Members of the association's Committee on Education from 1963 to 1965 are noted.

HRP-0010536/1GA Not available NTIS
Office of the Assistant Secretary for Health, Rockville, Md. Parklawn Health Library.
Public Law 93-641: National Health Planning and Resources Development Act.
Selected Bibliography
Salvador B. Waller, and Karen Fink. May 76, 7p
This is bibliography number 76-1.
Available from Parklawn Health Library, Dept. of Health, Education, and Welfare, Parklawn Bldg., 5600 Fishers Lane, Rockville, Md. 20852, one copy free.

Descriptors: Sources, Methodology, *Legislation, Law(Jurisprudence), Health care, Health care delivery systems, Documents, Availability.

Materials pertaining to P.L. 93-641, the National Health Planning and Resources Development Act, are presented in a selected bibliography compiled by the Parklawn Health Library, DHEW. Fifty books, journal articles, and reports, most published in 1975 and 1976, are listed under the subject headings: general, analysis, hospitals, and State. The listing includes summaries of the legislation itself and discussions of its possible impact on various professional groups, institutions, and State governments.

HRP-0010541/1GA PC$7.50/MF$3.00
Channel Counties Comprehensive Health Planning Council, Santa Barbara, Calif.
Health Systems Plan. Phase II 1976: Volume I.
1976, 179p
Grant PHS-09-P-000-042
Volume II is available as HRP-0010542.

Descriptors: Systems, State regions, State government, Plans, Methodology, Local government, *HSA(Health Systems Agencies), *Health systems agencies, Health resources, Health related organizations, *Health planning, Health care delivery, *Health care delivery systems, Development, Data acquisition, California.

Volume I of a health systems plan is presented for San Luis Obispo, Santa Barbara, and Ventura Counties in California. Volume II contains a health care facilities plan for the three counties. A chronology of comprehensive health planning in the three counties provides background information and describes the functions of the health systems agency. The area served is described in terms of geography, population demographics, and socioeconomic and health status indicators. Inventories are provided of facilities offering ambulatory care, acute inpatient care, long-term care, and intermediate care. Inventories of manpower are included. Priorities are identified and facilities inventoried for Ventura County. A Plan for Ventura County is offered which includes a description of needs assessment activities. Membership lists are appended. Portions of this document are not fully legible.

HRP-0010542/9GA PC$5.00/MF$3.00
Channel Counties Comprehensive Health Planning Council, Santa Barbara, Calif.
Health Care Facilities Plan. Chapter IV of Health Systems Plan - Phase II 1976. Volume II.
1976, 87p
Grant PHS-09-P-000-042
Volume I is available as HRP-0010541.

Descriptors: Systems, State regions, State government, Plans, Methodology, Local government, Health resources, Health related organizations, Health planning, *Health care facilities, Health care delivery, *Health care delivery systems, Development, Data acquisition, *Comprehensive health planning, California.

A health care facilities plan is presented for San Luis Obispo, Santa Barbara, and Ventura Counties, California in Volume II of a comprehensive health systems plan. The legal basis for the review of applications for new facilities is examined, and criteria are offered for determining need and for judging the merits of a proposal. Policies for the health systems plan are delineated, including methods of inventory, methods of determining need, and methods for determining bed requirements. All data are presented in tabular form. Appendices contain maps detailing boundaries and facility locations and a roster of health facilities and services review committees. Portions of this document are not fully legible.

HRP-0010543/7GA PC$5.00/MF$3.00
New Mexico State Health and Social Services Dept., Santa Fe. Comprehensive Health Planning Div.
New Mexico Plan for Treatment of End-Stage Renal Disease. State CHP, Appendix No. 1.
1974, 81p
State Health Plan available as HRP-0010544.

Descriptors: State government, Standards, Reviewing, Quality assurance, Plans, *New Mexico, Methodology, Measurement, Local government, Health care, *Health care delivery, Evaluation, Criteria, Assessments.

A plan for the treatment of end-stage renal disease (ESRD) is offered with the goal of restoring the greatest possible independence and sense of well-being to the kidney disease patients in New Mexico at a reasonable cost. The plan is designed to assure: available, appropriate treatment; reasonable costs; and efficient program management. A description of New Mexico is presented, as is a review of the treatment of ESRD. In June 1974, 54 patients were receiving limited care and satellite dialysis at six stations in New Mexico. Two methods are described as alternatives for projecting future hemodialysis and renal transplant needs: one method is based on past experiences and the other is based on a mini-max analysis. The organization of ESRD resources is discussed in terms of self-dialysis, satellite dialysis, limited care and center dialysis, specialized dialysis services, and transplantation. Recommendations are included for each organizational approach. The roles of advisory and review boards and community health planning are considered. Major recommendations include: offering one integrated self-dialysis training program to train at least 12 patients per year; establishing four additional satellite units; locating limited care facilities in Albuquerque; and temporary dialysis of pediatric patients until transplantation can take place. Appendices include projections to 1980 of patient load by service. Portions of this document are not fully legible.

HRP-0010544/5GA PC$11.00/MF$3.00
New Mexico Health and Social Services Dept., Santa Fe. Comprehensive Health Planning Div.
New Mexico Comprehensive Health Plan.
Oct 74, 406p
Appendix No. 1 - A Plan for Treatment of End-Stage Renal Disease is available as HRP-0010543.

Descriptors: Statistical distributions, State government, Standards, Reviewing, Quality assurance, Plans, *New Mexico, Methodology, Measurement, Local government, Health resources, Health occupations, Health care, *Health care delivery, Evaluation, Demography, Criteria, Communities, Assessments.

A comprehensive health plan for New Mexico is offered to assist in identifying health problems, setting priorities for these problems, addressing health problems, recommending effective use of resources, and recommending organizational arrangements for solving health problems. Following a brief description of demographic trends and demographic data by county, an overview of the comprehensive health planning process is presented. Personal health problems in the State are identified and ranked according to priority. Several types of interventions are described and ranked. A resource inventory includes health facilities, government departments, and manpower. Health scarcity areas are identified, as are organizational patterns and financing arrangements. Recommendations address seven broad goals with defined needs and recommended interventions. Each of these broad goals is related to one or more of the personal health problems previously identified. The review function as it relates to comprehensive health planning is outlined. Appendices contain lists of organizations and agencies and participants in workshops.

HRP-0010563/5GA Not available NTIS
Massachusetts Inst. of Tech., Cambridge.
Role of the Nurse in the Outpatient Department.
Preliminary Rept.
Warren G. Bennis, Norman H. Berkowitz, Mary F. Malone, and Malcolm W. Klein. 1961, 88p
Available from the American Nurses' Association, 2420 Pershing Rd., Kansas City, Mo. 64108, $3.00.

Descriptors: United States, *Nurses, Health resources, Health occupations, Health manpower, Health care utilization.

A preliminary report is presented on the role of the nurse in the outpatient department, based on a variety of research methods including observational studies, intensive interviews, and group questionnaires. Nurses' perceptions of the ideal nurse are described and nurses' perceptions of their roles are compared with their perceptions of the ideal nurse. Relationships of the outpatient nurse with the administrative system, with physicians, with patients, and with other nurses are examined. The organization of an outpatient department is described based on observations of seven outpatient departments in clinics and hospitals. Communication patterns, motivation, and supervision within the department are also described. Performance measures of patient care are discussed in terms of data already collected. Three performance variables are emphasized in patient care measurement: patient teaching, follow - through (patient self-care), and follow-up. Practical and theoretical implications of the study's results are considered. Appendices contain survey instruments.

NTIS/PS-76/0641/1GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Telecommunication in Medicine (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Elizabeth A. Harrison. Aug 76, 70p*
Supersedes NTIS/PS-75/580.

Descriptors: *Bibliographies, *Telecommunication, *Medical services, Consulting services, Hospitals, Medical records, Information systems, Closed circuit television, Telephone systems, Rural areas, Urban areas, Education.
Identifiers: Health care delivery systems, *Teleconsultation, Biomedical information systems, Medical education.

Research reports cover teleconsultation, communications for emergency medical services, medical communication networks and television systems, and telecommunications for medical information systems and rural health services. (This updated bibliography contains 65 abstracts, 29 of which are new entries to the previous edition.)

NTIS/PS-76/0646/0GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Sickle Cell Anemia (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Elizabeth A. Harrison. Aug 76, 44p*
Supersedes NTIS/PS-75/515, and NTIS/PS-74/114.

Descriptors: *Bibliographies, *Sickle cell anemia, Anemias, Blood diseases, Hereditary diseases, Diagnosis, Therapy, Genetics, Hematology.

Clinical and diagnostic aspects of sickle cell anemia are researched in the selected abstracts. (This updated bibliography contains 39 abstracts, 1 of which is a new entry to the previous edition.)

N76-25639/5GA PC$4.00/MF$3.00
West Florida Univ., Pensacola.
Detection and/or Prevention of Human Diseases Through Remote Sensing.
Quarterly Report.
J. A. Edmisten. 1976, 43p NASA-CR-147751, QR-3
Contract NAS9-11870

Descriptors: *Diseases, *Public health, *Red tide, *Remote sensors, Detection, Environmental monitoring, Epidemiology, Insects, Microorganisms, Pathogenesis, Prophylaxis, Vegetation.

For abstract, see STAR 1416

PB-254 288/3GA PC$4.50/MF$3.00
Linton and Co., Inc., Washington, D.C.
HRA Working Bibliography - Evaluation of the Impact of HRA Programs in State Departments of Human Resources.
16 Apr 75, 72p HRA/OA-74/2
Contract PHS-HRA-230-75-0089

Descriptors: *Bibliographies, *Human services, *Health planning, *Social services, Health resources, Impact, Evaluation, Projects.

An annotated bibliography to explore all pertinent documentation relating to health programs and consolidating human service agencies. The Bibliography was developed in conjunction with a study which seeks to document and analyze the interrelationships between HRA and other health programs and Departments of Human Resources with particular attention on impact on planning and services integration. Sixty references including reports, books, and journal articles. With only a few exceptions, most references were published between 1971 and 1974.

PB-254 667/9GA PC$4.50/MF$3.00
Sewall Rehabilitation Center for Cripple Children and Adults, Denver, Colo.
SPORT: Sewall Pre-Admission Opportunity for Rehabilitative Therapy.
Annual progress rept. 1974-75,
Carol Gregory, and Donna Erikson. Jun 75, 67p
SRS-51-40231-001
Grant SRS-51-40231

Descriptors: *Rehabilitation, *Mental deficiency, *Child health services, *Handicapped persons, Social services, Specialized training, Project planning, Therapy, Professional personnel, Paraprofessional personnel, Evaluation, Parent child relations, Objectives, Communities.
Identifiers: *Handicapped children, Mentally retarded persons.

This is an interim progress report of the first year (June 1974--June 1975) of The Sewall Pre-admission Opportunity for Rehabilitation Therapy (SPORT) Program of the Sewall Rehabilitation Center for Crippled Children and Adults. The project was to promote an early intervention program for developmentally disabled pre-school children to avoid institutionalization. Forty-one children with physical or mental handicaps participated. Five goals, which included working for the children's developmental progress, helping parents cope with their disabled child, establishing programs to educate professionals and promoting the involvement of other community agencies in the program, were established for the first year. During the year, these goals were accomplished, and evaluative tests of the children indicated that they had made progress toward the developmental goals set for them.

PB-254 771/9GA PC$10.00/MF$3.00
Policy Analysis, Inc., Boston, Mass.
An Econometric Model of the Dental Sector.
Final rept.,
Paul J. Feldstein, and Charles Roehrig. 30 Nov 75, 333p HRA/OC-76099
Contract N01-DH-44093

Descriptors: *Economic models, *Dentistry, *Health economics, Health care costs, Financing, Econometrics, Assessments, Manpower utilization, Government policies, Dental services, Dental personnel, Graphs(Charts), Tables(Data), Simulation, Sensitivity, Economic factors, Productivity, Utilization, Health insurance, Research.

The report is the result of a project designed to combine the unique concepts and talents of a dental economist and a computer systems analyst for the development of a computer based model of the dental care sector which would incorporate stringent economic concepts of supply and demand, cost and productivity functions, etc. The ultimate goal being the development of an instrument for facilitating the formulation and assessment of various policy options and for forecasting manpower requirements and their impact on costs, prices, utilization, organizational configurations and productivity.

PB-254 772/7GA PC$7.75/MF$3.00
Pugh-Roberts Associates, Inc., Cambridge, Mass.
Examining Alternatives for Improving the Nation's Oral Health. A System Dynamics Model of the Dental Care Delivery System.
Final rept.
1 Oct 75, 222p HRA/OC-76098
Contract N01-DH-44091

Descriptors: *Health care delivery systems, *Dental services, Dentistry, United States, Health planning, Government policies, Demography, Health care requirements, Dental personnel, Health insurance, Health economics, Third party payers, Health status, Health resources, Models, Computerized simulation, Health care utilization.
Identifiers: Appendices.

The report is the result of a project designed to provide a computer based simulation model of the Dental Delivery System in this country. Its primary objective being to facilitate the testing of complex policy issues and their consequences by planners and policy makers. It is designed to bring into manageable focus the problems associated with economic changes, shifts in population demographics, biometrics and manpower requirements.

PB-254 840/2GA PC$9.25/MF$3.00
Iowa Hospital Association, Des Moines.
Iowa Health Services Data System Acute Care Component.
Final rept. 1 Jan 72-31 Dec 73,
Donald Dunn. Dec 74, 278p NCHSR-76/1
Grant PHS-HS-00933
See also PB-223 739.

Descriptors: *Acute care, *Medical records, *Information systems, *Iowa, *Long term care, Patients, Hospitalizing, Hospital administration, Evaluation, Management information systems, Cost control, Statistical analysis, Surveys, Data processing systems.
Identifiers: *Hospital information systems, Appendices, Health services research and development, Biomedical information systems.

This is a detailed report of the establishment, maintenance, and use of a state-wide clinical data set, using The Uniform Hospital Discharge Data Demonstration (PB-223 739/AS) as a model. The present report comprises the acute care and the long-term care components of a viable computerized statewide hospital data system.

PB-254 920/2GA PC$6.00/MF$3.00
Moshman Associates, Inc., Bethesda, Md.
Evaluation of the Feasibility of an Independent HSA Data Base Relative to Proposed HSA Budgets and Staffing.
Final rept. 10 Oct 75-10 Feb 76.
10 Feb 76, 149p BHPRD-76/2
Contract PHS-HRA-230-75-0082

Descriptors: *Health systems agencies, *HSA(Health Systems Agencies), *Comprehensive health planning agencies, *CHP(Comprehensive Health Planning Agencies), *Information systems, Criteria, Standards, Feasibility, Cost analysis, Methodology, Tables(Data), Evaluation, Budgeting, Surveys, Characteristics, Manpower, Recommendations.
Identifiers: Data bases, Appendices.

The study looks at the feasibility of centralization of HSA data bases, standards and criteria for determining when such centralization is indicated, and methods of estimating staffing and other costs. The study, which involved site visits to nine selected CHP Agencies, sought to measure the comparative advantages (economic, data availability, etc.) of each of the following alternatives (1) HSA-maintained data base, conservatively estimated at $40,000 - $50,000 annually, (b) centralization at state level or group level, i.e., states or HSAs. It concluded that 'when appropriate conditions are met' centralization of a data base 'can most logically and naturally occur at the state level with primary attention to the type of the data that are available from state level sources.'

PB-254 967/3GA PC$4.00/MF$3.00
Mayo Foundation, Rochester, Minn.
Immunologic Studies in Sarcoidosis.
Annual rept. Jul 75-Apr 76,
John D. Stobo. Apr 76, 26p NIH-N01-HR-4-2959
Contract N01-HR-4-2959
See also report dated Jun 75, PB-248 386.

Descriptors: *Sarcoidosis, *Respiratory diseases, *Immunology, *Gamma globulin, Skin diseases, Immunity, Antigens, Antibodies, Lymphocytes, Leukocytes, Blood cells, Tissue culture, Tests, In vitro analysis.
Identifiers: *Hypergammaglobulinemia, *Immunoglobulins, Cellular immunity, Humoral immunity, T cells, B cells.

Investigation of possible defects of immunoregulation related to the hypergammaglobulinemia noted in patients with sarcoidosis revealed the following. Incubation of patients' peripheral blood mononuclear cells in culture medium resulted in the liberation of a soluble material capable of augmenting in vitro immunoglobulin production among normal lymphocytes approximately two fold. The ability to detect this material demonstrated a significant direct correlation with patients' immunoglobulin levels, implying that this material may be causally related to the polyclonal elevations of immunoglobulin noted in sarcoidosis.

PB-254 997/0GA PC$5.50/MF$3.00
United Cerebral Palsy of New York, Inc.
Demonstrate Transdisciplinary Training and Operations.
Final rept.
1974, 124p SRS-56-71099-001
Grant SRS-56-71099

Descriptors: *Mental deficiency, *Specialized training, *Mental health care, *Health manpower education, Medical personnel, Objectives, Evaluation, Education.
Identifiers: *Mentally retarded persons, Appendices, Disabled persons, *Team training, Social workers, Educators.

The purpose of the project directed by United Cerebral Palsy Associations was to demonstrate transdisciplinary training and operations as used in the care of the severely developmentally disabled. Four transdisciplinary teams participated in the training efforts: (1) The Worcester Regional Center at Shrewsbury, Massachusetts, (2) The Rosewood Center in Maryland, (3) The Ebensburg State School in Pennsylvania and (4) The Lynchburg Training School and Hospital in Virginia. The training had four phases, the last one being self-evaluation and feedback. All teams agreed that they had made some progress. Based on the success of the program, other institutions have started similar efforts.

PB-254 999/6GA PC$9.25/MF$3.00
Epilepsy Foundation of America, Washington, D.C.
Epilepsy Rehabilitation.
Final rept.,
George N. Wright. Jan 75, 289p*
Grant SRS-15-55086
Library of Congress catalog card no. 74-4936. Prepared in cooperation with Wisconsin Univ., Madison. Regional Rehabilitation Research Inst., Contract SRS-44-25183 and SRS-15-55208.

Descriptors: *Rehabilitation, *Epilepsy, Convulsive disorders, CNS disorders, Reviews, Health manpower education, Therapy, Counseling, Law(Jurisprudence), Psychology, Sociology, Evaluation, Vocational guidance, Education, Handicapped workers.
Identifiers: Appendices, Vocational rehabilitation.

The Epilepsy Foundation of America (EFA) and the University of Wisconsin Madison Regional Rehabilitation Research Institute (UW-RRRI) combined forces to: (1) develop a special interdisciplinary conference for sharing research knowledge and methods relevant to rehabilitating clients with epilepsy and (2) review the available literature and prepare a book on rehabilitation and epilepsy for use by all members of the rehabilitation team. The result was a collection of 12 essays on various aspects of epilepsy rehabilitation by 16 different authorities for use in graduate, undergraduate and professional education by physicians, nurses, psychologists, social workers and rehabilitation counselors. Also included in the book are case histories and a glossary of terms.

PB-255 013/5GA PC$13.75/MF$3.00
Illinois State Dept. of Public Health, Springfield. Div. of Emergency Medical Services and Highway Safety.
A Plan for the Development of a Total Emergency Medical Services System for the State of Illinois.
Final rept.
Jul 75, 591p
Contract PHS-HSM-110-72-345

Descriptors: *Emergency medical services, *Illinois, Projects, Health care utilization, Health care delivery systems, Objectives, Costs, Systems engineering, Predictions, Forecasting, Tables(Data), Bibliographies.
Identifiers: Appendices.

In 1972 it was obvious that an environment existed in the state of Illinois for the expansion of the existing trauma care system to a total statewide emergency medical services delivery system. The existing deficiencies in emergency medical services delivery were brought to public attention during the initial year of the trauma program. The medical expertise and technology necessary for the solution of this previously neglected health problem have always been available in Illinois. Better utilization of these available resources was needed before any beneficial effect could be felt on existing but poorly organized care. However, in some areas a total upgrading and development of an essentially non-existant emergency medical care system was necessary. Portions of this document are not fully legible.

PB-255 019/2GA PC$3.50/MF$3.00
American Public Health Association, Washington, D.C.
Epidemiology Studies. Task 1, Phase 1: Pilot Study of Cancer Mortality Near an Arsenical Pesticide Plant in Baltimore.
Final rept.,
Genevieve Matanoski, Emanuel Landau, and Elizabeth Elliott. May 76, 25p EPA/560/6-76/003
Contract EPA-68-01-2490

Descriptors: *Malignant neoplasms, *Epidemiology, *Carcinogens, *Pesticides, *Arsenic, Chemical industry, Industrial plants, Pulmonary neoplasms, Populations, Communities, Air pollution, Exposure, Mortality, Public health.
Identifiers: *Cancer, Carcinogenesis, *Air pollution effects(Humans), Health risks.

The present study was a preliminary attempt to determine the feasibility of using cancer mortality data to indicate the carcinogenic effects of possible arsenic exposure in the environment. The four census tracts for which fifty percent of the areas lay within a 3/4 mile radius of an arsenical-producing insecticide plant were matched by such demographic characteristics as age, race, sex, and socioeconomic status with all other similar tracts in Baltimore City. The matching tracts were then subdivided according to suspected differences in exposure to environmental pollution. The lung cancer mortality was higher for the combined tracts adjacent to the plant as compared to the control tracts. The lung cancer mortality for the tract in which the plant was located was three to four times higher than in controls tracts, a difference which was significant. The data also support a northerly gradient in rates with increasing distance from the plant.

PB-255 026/7GA PC$4.00/MF$3.00
Pennsylvania Univ., Philadelphia. School of Medicine.
In vitro Diagnostic Test for Sarcoidosis.
Annual rept. Jul 75-Jun 76,
Burton Zweiman, and S. Michael Phillips. 30 Jun 76, 25p NIH-N01-HR-42955-T76
Contract N01-HR-4-2955
See also report dated Apr 75, PB-248 766.

Descriptors: *Sarcoidosis, *Immunology, Granuloma, Respiratory diseases, Skin diseases, In vitro analysis, Diagnosis, Lymphocytes, Leukocytes, Blood cells, Antibodies, Antigens, Tissue culture, Tests, Assaying.
Identifiers: Kveim's test(Sarcoidosis), Lymphocyte transformation, Migration inhibition factor.

In vitro leukocytes reactivities of sarcoids, normals and patients with other disease states have been compared. In over 115 experiments, it has been found that Kveim suspension induce a modest degree of proliferation in lymphocytes of about 30% of sarcoid patients but only occasionally in normals and other diseases. Kveim-reactive lymphocytes are less responsive to PHA but no other correlations are apparent. Other assays for in vitro studies of lymphocyte reactivity are underway.

PB-255 066/3GA PC$4.00/MF$3.00
Mayo Foundation, Rochester, Minn.
In vitro Test for Sarcoidosis.
Final rept. Jul 74-Jun 76,
F. Kueppers. Jun 76, 31p NIH-N01-HR-4-2959
Contract N01-HR-4-2959
See also report dated Jun 75, PB-248 386.

Descriptors: *Sarcoidosis, *Respiratory diseases, *Immunology, In vitro analysis, Antigens, Antibodies, Spleen, Patients, Tests, Globulins, Diagnosis.
Identifiers: Humoral immunity, Immunoglobulins, Kveim's test(Sarcoidosis).

The report is concerned with investigations of the humoral immunity in sarcoidosis. It was the aim of this study to develop an in vitro test for sarcoidosis and collect data that will be useful in the development of such a test. It was explored whether there is antibody present in sera of patients with sarcoidosis that is directed against constituents of the normal or sarcoid spleen. The data show in some sera from patients with sarcoidosis binding of IgM to normal spleen material above the binding found in serum of healthy donors. The specificity of this finding needs to be further explored. The levels of immunoglobulin classes IgA, IgG and in particular, IgM were elevated while the concentration of IgE was in the normal range. No definite evidence for an antibody directed against Kveim or spleen material was obtained.

PB-255 067/1GA PC$5.00/MF$3.00
Moshman Associates, Inc., Bethesda, Md.
Collection of Data on Linkage Systems Mechanisms and Their Relationship to New Agencies and Plans Under P. L. 93-641.
Final rept. 2 Mar 76-18 Jun 76,
B. Ralph Stauber. 18 Jun 76, 80p HRA/OA-76/5
Contract PHS-HRA-230-75-0082

Descriptors: *Health systems agencies, *HSA(Health Systems Agencies), *Health manpower, State government, Evaluation, Legislation, Law(Jurisprudence), Health manpower education, Health planning, Agencies.

The Bureau of Health Manpower and the Regional Offices funded linkage system contracts in about 20 states in fiscal year 1974. The purpose of the linkage system contracts was to bring together existing data on health manpower for the development of a plan toward state legislative and executive agencies in allocating resources for health manpower education. Knowledge of the linkage system contracts and their progress and problems could be helpful to the HSAs being developed under P.L. 93-641. The study examined ten linkage contracts operations in order to determine methodologies and review progress and problems. The study found that mechanisms can be developed, based on the laws, governmental structures, and practices of the individual states, that will promote coordination of planning, training, credentialing, and utilization of health manpower within the decision-making levels of state government. These various mechanisms and their application are described in the report. Factors which favor successful linkage operations and those which are liabilities are also reviewed in the final report.

PB-255 068/9GA PC$5.50/MF$3.00
Simmons (Walt R.), Alexandria, Va.
Issues Regarding Confidentiality of Data in the Cooperative Health Statistics System.
Final rept. 29 May 74-25 May 76,
Walt R. Simmons. 25 May 76, 119p NCHS-74-7-2
Contract PHS-HRA-106-74-25

Descriptors: *Health statistics, *Information systems, *Confidential information, Medical records, Political systems, Recommendations, Ethics, Economic factors, Legislation, Regulations, Specialized training, Public relations, Evaluation.
Identifiers: Appendices, Communication networks, Freedom of Information Act.

The value of assurances of confidentiality from leading statistical agencies, the Freedom of Information Act, the economy of utilizing the same data by more than one agency for more than one purpose and the conflict between 'need-to-know' and 'right-to-privacy' constituted the central problem for this study. The study also identifies the nature and character of major issues having an impact on confidentiality in the Cooperative Health Statistics System (CHSS); delineates programs that could be directed toward resolution of the major issues; and techniques for processing and reformatting health data in order to yield maximum information while avoiding confidentiality issues. The report also contains recommendations for National Center for Health Statistics (NCHS) on developing a Model State Law on CHSS confidentiality; maintaining promises of confidential treatment, developing a system which contains certain elements of flexibility

that permit customized variations of procedures, training CHSS staff concerning confidentiality issues and maintaining a public relations program to promote wide understanding of the essence of statistical purposes.

PB-255 291/7GA PC$8.00/MF$3.00
Ralph K. Davies Medical Center, San Francisco, Calif. Dialysis Treatment and Research Center.
Solute Kinetics of Intermittent Dialysis Therapy.
Annual progress rept. no. 2, 30 Jun 74-31 Dec 75,
F. A. Gotch, J. A. Sargent, M. L. Keen, M. Lam, and M. Prowitt. 19 Jan 76, 229p AK-2-4-2202
Contract ND1-AM-4-2202
See also Annual progress rept. no. 1, PB-239 198.

Descriptors: *Urea, *Artificial kidneys, Metabolism, Patients, Therapy, Diet therapy, Dialysis, Mathematical models, Blood, Transport properties, Evaluation.
Identifiers: *Hemodialysis.

Kinetic modeling based on urea metabolism has been studied in 51 patients. Patient response to modeled therapy has been exhaustively investigated. Factors examined were: Nutrition, ultrafiltration requirements and associated morbidity potassium, acid-base, phosphorous and calcium metabolism, anemia, peripheral neuropathy, frequency and duration of hospitalization, rehabilitation, and cumulative survival. None of these factors were found to be adversely affected by individualization of therapy. Five patients have been studied under controlled nitrogen metabolic conditions. These studies verified the clinical kinetics as an accurate method. They revealed that dialysis may very well be a catabolic influence on dialysis patients. Patients on high and low protein diet were found to be relatively catabolic on dialysis days compared to off days. On the high protein diet they were anabolic on the off days. Acetate kinetics were evaluated. Patients were found (a) to seldom reach steady state levels during 3-5 hour dialyses, and (b) to have saturated metabolic mechanisms for this anion at blood levels found during dialysis.

PB-255 310/5GA PC$6.00/MF$3.00
Orkand Corp., Silver Spring, Md.
Analytic Report for Inventory and Assessment of Health Agency Planning and Evaluation Studies.
Nov 75, 129p TR-75W-048, BHSR-74-24E
Contract PHS-HRA-116-74-133
See also PB-255 311.

Descriptors: *Health planning agencies, Objectives, Assessments, Evaluation, Analyzing, Tables(Data), Inventories, A agencies, B agencies, Comprehensive health planning, Regional medical programs, RMP(Regional medical programs), Health care delivery systems.
Identifiers: Appendices.

Analytic processes surrounding the initiation, performance, and impact/acceptance of 61 studies performed at 16 selected health planning agencies are described in one end-product of a project undertaken to assess health agency planning and evaluation studies. The analysis of studies performed by comprehensive health planning (a) and (b) agencies, regional medical programs, and Experimental Health Service Delivery System agencies is intended to benefit planners working in the Health Systems Agencies created by P.L. 93-641. The report presents descriptive and interpretative information on health planning variables of interest, broken down by study area and by type of health planning agency. Key relationships in the health planning process are examined.

PB-255 311/3GA PC$6.00/MF$3.00
Orkand Corp., Silver Spring, Md.
Evaluation of Community Funds Flow.
Final rept.
17 Sep 75, 127p TR-75W-025, BHSR-74-24F
Contract PHS-HRA-116-74-133
See also PB-255 312.

Descriptors: *Cash flow, *Health care, *Communities, Interviews, Methodology, Analyzing, Surveys, Expenses, Objectives, Evaluation, Health care delivery systems, Comprehensive health planning agencies.
Identifiers: Appendices.

Results are reported of a study that examines the implementation and utilization of the Community Funds Flow (CFF) methodology. CFF is an accounting technique which traces the monies expended for health care by the public and private sectors of the economy and identifies both the sources of health care dollars and their uses. Site visits and telephone interviews were employed to obtain data concerning CFF implementation and utilization. It was found that local Experimental Health Services Delivery System (EHSDS) agencies were able to implement funds flow with varying degrees of success, and experiences indicate that there is not best approach to data collection. Technical problems most frequently encountered in CFF implementation include: unavailability of data, deficiencies in expenditures or source categories, inadequate accounting for import or export of services, and unsatisfactory geographic characteristics. Appendices include: The EHSDS Product Guide and CFF Supplement; CFF descriptions and interview outline; the CHP discussion topic guide; and CHP site visit outline.

PB-255 312/1GA PC$5.50/MF$3.00
Orkand Corp., Silver Spring, Md.
An Evaluation of State Hill-Burton Reporting Systems for Free Care and Community Services to the Poor, Provided for by Federally Assisted Health Facilities.
17 Jul 75, 118p TR-75W-022, BHSR-74-22
Contract PHS-HRA-230-75-0081
See also PB-255 311.

Descriptors: *Community health services, Evaluation, Socioeconomic status, Surveys, Agencies, State government, Effectiveness, Recommendations, Objectives, Requirements, National government, Reporting, Legislation, Regulations.
Identifiers: Hill-Burton projects.

Results of a 30-day survey of seven regional offices and 15 State agencies to evaluate the completeness and effectiveness of State reporting systems under the Hill-Burton regulations concerning free care are reported. A review of the Hill-Burton program and its objectives and requirements is provided. Seven broad areas of responsibilities are imposed on State agencies for enforcement of the Hill-Burton program: assurances of facilities, presumptive compliance certification, compliance report submission, State agency and State plan requirements, review process and procedures development, evaluation and enforcement, and reports to DHEW. It was found that all visited State agencies required two assurances from applicants: that a reasonable volume of services are available to persons unable to pay, and that community services will be provided. In addition, all visited State agencies obtained one-time facility certification upon request of DHEW.

PB-255 393/4GA PC$6.00/MF$3.00
Bureau of Radiological Health, Rockville, Md.
Organ Doses in Diagnostic Radiology.
Technical rept.,
Marvin Rosenstein. May 76, 133p* FDA/BRH-76/68, DHEW/PUBL/FDA-76/8030
Prepared in cooperation with Oak Ridge National Lab., Tenn.

Descriptors: *Radiology, *Health physics, *Radiation dosage, Tissues(Biology), Lung, Diagnosis, Monte Carlo method, X ray analysis, Musculoskeletal system, Tables(Data), Sex glands, Radiography, Ovary, Testis, Computation, Uterus, Embryos, Thyroid gland, Bone marrow.
Identifiers: Organs(Anatomy), Phantoms.

A computational method generally applicable for the estimation of organ doses from diagnostic radiology procedures is presented. The underlying methodology utilizes a Monte Carlo radiation transport technique and an anthropomorphic and heterogeneous phantom containing mathematically described organs, including lung and skeletal regions. Using the technique, tissue-air ratios have been generated for the testes, ovaries, active bone marrow, thyroid and embryo/uterus of a reference adult patient for various photon energies and views (AP, PA, LAT). From the tissue-air ratios, a compilation of organ doses per unit entrance exposure, free-in-air (mrad/R) has been developed as a function of beam quality (HVL, mm Al) for projections common in diagnostic radiology. Detailed material is presented on the methods, application procedures and comparisons to literature data.

PB-255 407/9GA PC$3.50/MF$3.00
Greenfield, Attaway and Tyler, Inc., San Rafael, Calif.
Determination and Possible Public Health Impact of Transition Metal Sulfite Aerosol Species.
Topical rept.,
Anthony V. Colucci, and Delbert J. Eatough. Jul 76, 23p EPRI/EC-184
Prepared in cooperation with Brigham Young Univ., Provo, Utah.

Descriptors: *Sulfites, Aerosols, Public health, Sodium sulfites, Utah, Epidemiology, Air pollution, Sulfur oxides, Transition metals, Sulfates, Tables(Data), Etiology, Particles.
Identifiers: *Environmental health, *Air pollution effects(Humans), Air pollution control.

The study attempts to gather necessary preliminary analytic information on sulfite, one species of particulate sulfur oxide. Data suggest that adverse health effects observed in Utah through epidemiologic studies which are attributed to suspended sulfates might, if proven valid, be partially attributable to atmospheric sulfite complexes in addition to or rather than sulfate. Yet another significant implication of the proposed adverse health impact of aerosol sulfite species is in the area of pollutant abatement strategy. Available data suggest that the level of S(IV) species in particulates is controlled by the level of transition metals capable of complexing with SO3(2-) (principally Fe) and not by the ambient SO2 level. Given this fact proper future control strategies could very well primarily involve control of a broad spectrum of particulate emissions, rather than SO2 removal alone.

PB-255 461/6GA PC$3.50/MF$3.00
Orkand Corp., Silver Spring, Md.
Evaluative Study to Design and Develop a Hill-Burton Assurance Monitoring System.
Summary rept. 20 Oct 75-25 May 76,
25 May 76, 25p TR-76W-046, BHPRD-76/3
Contract PHS-HRA-230-75-0081

Descriptors: *Health care facilities, Evaluation, Monitors, Regulations, Construction, Design, Objectives.
Identifiers: *Hill-Burton projects.

One condition of all federal funding awards under the Hill-Burton programs is that any facility receiving government funds must provide a reasonable volume of uncompensated services to persons unable to pay. The purpose

of this study was to design and develop an Assurance Monitoring System to monitor the data submitted by each health care facility in compliance with regulations concerning provision of uncompensated services, community services, proper information, and posting proper signs. The report includes a summarization of each deliverable including a Functional Requirements Analysis Report, Technical System Design Specifications, a User's Guide Manual, and a Systems Operations Manual.

PB-255 494/7GA PC$4.00/MF$3.00
Mayo Clinic, Rochester, Minn.
Uremic Neuropathy.
Annual rept. 17 Apr 75-16 Apr 76,
Peter James Dyck, William J. Johnson, Edward H. Lambert, Peter P. Frohnert, and Carl F. Anderson. 7 Jan 76, 34p AK-3-2-2200
Contract N01-AM-2-2200
See also report dated Dec 74, PB-243 170.

Descriptors: *Uremia, *Neurology, *Bioinstrumentation, Patients, Dialysis, Perception, Nervous system, Skin(Anatomy), Proteins.
Identifiers: Chronic diseases, *Hemodialysis, *Neuropathology.

Development of Mayo Touch-Pressure and Pallesthesia System III is complete and engineering descriptions and drawings are available. Normative values of touch-pressure sensation of finger and toe have been obtained on more than 100 persons. Twenty-four patients with chronic renal disease have been entered into a controlled study of short versus long hemodialysis. Preliminary results indicate that by nephrologic criteria the short dialysis schedule provided marginal dialysis but so far no difference in peripheral nerve function between schedules has been demonstrated. Eight patients entered the study of early vs late onset of hemodialysis on peripheral nerve function. Sixteen patients with chronic renal disease are being serially evaluated by nephrologic and biochemical criteria.

6F. Environmental Biology

AD-A027 408/8GA PC$4.00/MF$3.00
Cold Regions Research and Engineering Lab Hanover N H
Revegetation in Arctic and Subarctic North America. A Literature Review,
Larry Johnson, and Keith Van Cleve. Jun 76, 38p Rept no. CRREL-76-15

Descriptors: *Vegetation, *Environmental management, *Alaska, Arctic regions, Subarctic regions, Climate, Permafrost, Ecology, Hazards, Grasses, Trees, Fertilizers, Seeding, Reviews.
Identifiers: Revegetation.

A literature review of revegetation and biological aspects of restoration research was completed for arctic and subarctic North America. Although there is a great deal of climatic variation in this region it is generally characterized by extreme conditions, such as a short growing season and permafrost. Most of the revegetation research has been undertaken in the last six years as a result of increased natural resource development. The primary goal has been erosion control, with aesthetics, minimization of thermokarst, and production of browse as other objectives. Revegetation and long-term restoration methods depend upon such variables as the site conditions, nutrient regime (especially as this is influenced by the climatic conditions in the Arctic and Subarctic), plant adaptations, and the selection of native or introduced species. Technologies which have been developed to meet these conditions primarily include seedbed preparation, use of seed mixes, and fertilization and seeding methods. Most of the research has focused on the use of agronomic grasses and legumes. These are selected on the basis of a number of factors, such as cold hardiness and growth form prior to evaluation in the laboratory and the field. The most successful species to date have been Arctared fescue and Nugget bluegrass in the Arctic, while these two as well as creeping red fescue, meadow foxtail, Frontier reed canarygrass, Durar hard fescue, slender wheatgrass, and Icelandic poa did well in the Subarctic. Similar methods have been attempted to a more limited extent with evaluation of native herbaceous and woody species which seem promising on the basis of natural succession studies.

AD-A027 737/6GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Some Thoughts on Hearing Conservation: Possible Corrections to Equal Energy Rule to Account for Intermittency and Impulse Noise,
Daniel L. Johnson. 1975, 5p Rept no. AMRL-TR-75-4
Presented at the National Noise and Vibration Control Conference, 30 Apr-2 May 75, Atlanta, Ga.
Availability: Pub. in Proceedings of the Technical Program - NOISE EXPO, p1-4 1975.

Descriptors: *Noise Pollution, *Impulse noise, Hearing, Noise(Sound), Federal law, Exposure(Physiology), Audiometry, Thresholds(Physiology), Deafness, Reprints.
Identifiers: Equal energy rule, Environmental protection agency.

This paper considers two related topics. The first topic concerns a possible compromise between using the equal energy rule (3 dB/halving of time) and the 5 dB rule (5 dB halving of time) for evaluating nonsteady noises. By using this combination, it is possible to preserve one of the key benefits of the equal energy rule. This benefit is that it can reasonably approximate the hearing criteria for impulse noise exposure. Discussion of the use of equal energy for assessing impulse noise effects makes up the second part of this paper. (Author)

PB-254 877-T/GA PC$4.50/MF$3.00
Environmental Protection Agency, Research Triangle Park, N.C. Translation Services Section.
Molybdenum-Infiltrated Biogeochemical Provinces (Biogeokhimicheskie Provintsii, Obogashchennie Molibdenom),
V. V. Kovalskii, and G. A. Yarovaya. 1966, 55p EPA-TR-76-219
Trans. of Agrokhimiya (USSR) n8 p88-91 1966.

Descriptors: *Food chains, *Molybdenum, *Plants(Botany), *Toxic diseases, Metals, Ingestion(Biology), Domestic animals, Veterinary medicine, Humans, Ecology, Soil chemistry, Translations, USSR.

The regions in Armenia that were studied are biogeochemical provinces infiltrated by molybdenum. The content of molybdenum in the soils, waters, and living organisms in these provinces exceed the usual concentration of this element in other regions. Maximum quantities of molybdenum are found in slightly alkaline and neutral soils, as well as in soils the features of which are high contents of organic matter. It is in these soils that the molybdenum is most available for plants. Biochemical research resulted in findings of definite reactions on the part of animal organisms to an elevated content of molybdenum in the environment. An endemic disease that is similar in its symptoms to podagra develops in man within the limits of the Ankavan molybdenum province. The disease is accompanied by an increased blood molybdenum content, increased excretion from the organism of copper, increased xanthine oxidase activity, and an increase in blood uric acid content.

PB-255 096/8GA PC$4.00/MF$3.00
Environmental Monitoring and Support Lab., Las Vegas, Nev. Monitoring Systems Research and Development Div.
Methylmercury: Formation in Plant Tissues.
Final rept.,
Don D. Gay. May 76, 36p EPA/600/3-76/048

Descriptors: *Mercury(Metal), *Plant chemistry, Ecology, Absorption(Biology), Plant physiology, Trace elements, Tissues(Biology), Pollution, Environments, Leguminous plants, Metabolism.
Identifiers: Bioaccumulation.

Methylmercury was found in the tissue of the pea plant (Pisum sativum) after spraying mercuric nitrate onto the leaves, after planting in mercuric nitrate or phenylmercuric acetate contaminated soil and after infiltration and incubation of stems, leaves, and apices in mercuric nitrate or phenylmercuric acetate solutions. The concentration of mercury added in each experiment was 10 micrograms/gram. Younger pea tissue formed more methylmercury than older tissue. Methylmercury was also found in three different species of plant growing near an abandoned mercury mine.

PB-255 097/8GA PC$4.50/MF$3.00
Environmental Monitoring and Support Lab., Las Vegas, Nev. Monitoring Systems Research and Development Div.
Concentration Factors and Transport Models for Radionuclides in Aquatic Environments. A Literature Report.
Final rept.,
Robert G. Patzer. May 76, 84p* EPA/600/3-76/054

Descriptors: *Water pollution, *Radioactive isotopes, *Aquatic biology, *Food chains, Indicator species, Ecology, Absorption(Biology), Freshwater biology, Marine biology, Aquatic animals, Radiation dosage, Transport properties, Mathematical models, Environments, Public health, Concentration(Composition).
Identifiers: Bioaccumulation, Aquatic ecosystems, *Radioecology, Path of pollutants, Water pollution effects(Humans).

The relative risks to man from radionuclides released to the environment depend heavily on their accumulation or concentration by aquatic organisms. The organisms which accumulate those radionuclides present in the environment may be useful as indicators for environmental monitoring purposes. In addition, these organisms may be directly in food chain pathways to humans. Literature is reviewed and summarized in regard to biological concentration of radionuclides in freshwater and marine environments. Concentration factors for elements found in organisms are tabulated for plants, invertebrates, and fish in marine and freshwater environs. Literature is also reviewed on models developed to calculate the possible radiation dose delivered to humans from radionuclides released into aquatic environments.

PB-255 139/6GA PC$6.00/MF$3.00
Oklahoma Cooperative Fishery Unit, Stillwater.
Collection of Papers Presented at the Fish Kill Investigation Seminar on 2-4 Nov 71,
Apr 72, 141p
Sponsored in part by Environmental Protection Agency, Dallas, Tex. Region VI. See also PB-230 323.

Descriptors: *Meetings, *Fishes, Investigations, Mortality, Toxicity, Manuals, Law(Jurisprudence), Endrin, Public relations, Diseases, Toxicology, Water pollution, Missouri, Alabama, Arkansas, Strip mining, Crude oil.
Identifiers: *Water pollution effects(Animals), *Fishkill.

Contents:
A preface for the investigation of fish kills;

Steps in establishing good public relations with the media and the public;
Investigation of fish kills in Missouri;
Natural variations in fish populations;
Mortalities from miscellaneous causes and important environmental considerations;
Toxicant caused fish kills - collection, preservation, and analysis of inorganic samples;
Collection, preservation, and analysis of organic samples;
Fish kill investigations and techniques;
Kill number estimates;
The fish kill investigation report;
Investigation of petroleum caused fish kills;
An endrin-caused fish kill in Arkansas - a case history;
Pollution caused by strip mining in Missouri - a case history.

PB-255 465/7GA PC$3.50
Hawaii Agricultural Experiment Station, Honolulu.
Pesticides in Water: Organochlorine Pesticide Residues in Water, Sediment, Algae, and Fish, Hawaii--1970-71,
Arthur Bevenue, John W. Hylin, Yoshihiko Kawano, and Thomas W. Kelley. 1972, 10p
UNIHI-SG-JC-73-13, HAES-Journal Ser-1378, NOAA-76032301
Pub. in Pesticides Monitoring Jnl., v6 n1 p56-64 Jun 72.

Descriptors: *Hawaii, *Pesticides, *Chlorine organic compounds, Water pollution, Algae, Fishes, Sediments, Water chemistry, Dieldrin, DDT, Chlorobenzenes, Water quality, Water analysis, Water treatment.
Identifiers: Sea Grant program, Water pollution effects(Animals), Water pollution effects(Plants), Reprints.

Rainwater, drinking water, and nonpotable waters in Hawaii were sampled and found to contain chlorinated insecticide residues in the low parts-per-trillion range. Dieldrin, p,p'-DDT, and lindane were the pesticides most prevalent; pentachlorophenol was present in samples from a sewage fallout. The ratio of chlorinated pesticide residues in canal waters to residues in algae, sediment and fish from the same canals was 1:4,000:9,000:32,000, respectively. According to proposed water quality standards, results of this study indicated that pollution of Hawaii's water by organochlorine pesticides does not occur to any significant degree.

PB-255 555/5GA PC$6.75/MF$3.00
Environmental Protection Agency, Denver, Colo. Div. of Air and Water Programs.
Environmental Effects of Fluoride: Glacier National Park and Vicinity,
C. C. Gordon. Feb 74, 155p EPA-908/1-74/001

Descriptors: *Fluorides, Environments, Halogens, Food chains, Tables(Data), Pathology, Plant pathology, Sampling, Animals, Plants(Botany), Vegetation, Plant metabolism, Montana, Air pollution.
Identifiers: *Air pollution effects(Animals), Appendices, *Bioaccumulation, *Glacier National Park, Columbia Falls(Montana), *Air pollution effects(Plants).

During the summer and fall of 1970, a study of fluoride accumulation and its pathological effects on many species of flora and fauna was carried out in the areas of Columbia Falls, Montana, and Glacier National Park. Results of fluoride analyses of other vegetation of species foraged by animals (e.g., grasses and woody shrubs) demonstrated that fluoride accumulation occurs in nonconiferous species as well. Samples of grasses from seven sampling zones, representing more than half of the study area, yielded fluoride concentrations greater than those from control areas by a factor of 2 or more. This phenomenon of increasing fluoride concentrations in the food chain was observed in all parts of the study area where above-normal concentrations of fluoride were accumulating in vegetation.

6H. Food

NTIS/PS-76/0644/5GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Food Processing. Volume 2. July 1974-July 1976 (A Bibliography with Abstracts).
Rept. for Jul 74-Jul 76,
Elizabeth A. Harrison. Aug 76, 224p*
Supersedes NTIS/PS-75/576, and NTIS/PS-74/119.

Descriptors: *Bibliographies, *Food processing, Freeze drying, Fish protein concentrates, Food irradiation, Food preservation, Food contamination, Seafood, Frozen foods, Fruits, Vegetables.

All types of food processing, but primarily food irradiation, fish protein processing, and freeze drying are subjects included in the selected abstracts. (This updated bibliography contains 219 abstracts, 124 of which are new entries to the previous edition.) See also NTIS/PS-75/577, Food Processing. Vol. 1. 1964-July 1974.

N76-25797/1GA PC$7.50/MF$3.00
Massachusetts Inst. of Tech., Cambridge. Dept. of Nutrition and Food Science.
Mechanisms of Deterioration of Nutrients.
Annual Report, 13 Mar. 1975 - 13 Mar. 1976.
M. Karel, and J. M. Flink. 13 Mar 76, 197p NASA-CR-147780
Contract NAS9-12485

Descriptors: *Deterioration, *Food, *Freeze drying, *Nutrition, Dehydrated food, Electron microscopes, Fruits, Microstructure, Solvent extraction, Storage stability.

For abstract, see STAR 1416

PB-254 973/GA PC$66.00, MF$9.75
Flavor and Extract Manufacturers' Association of the United States, Washington, D.C.
Scientific Literature Review of Aliphatic Primary Alcohols, Aldehydes, Acids, and Related Esters in Flavor Usage.
Final rept. 1950-1975.
1975,7 reportsature Review of Aliphatic Primary Alcohol

The Scientific Literature Review summarizes the available scientific literature from 1950 to 1975 related to the safety of 303 synthetic flavor substances used as food ingredients. The substances are selected from aliphatic primary alcohols, aldehydes, acids, and related esters. The review summarizes the natural occurrence, usage, chemical, and biological data on the substances in a 2,457 page review containing 10,064 references. For individual volumes, see below:
FDA/HFF-76/42. FDABF-GRAS-233-V1-Rev. Section I. Background, Procedures Followed and General Findings. Volume 1. 1975, 315p PC$9.75, MF$3.00, supersedes PB-234 881 **PB-254 974/9GA**
FDA/HFF-76/43. FDABF-GRAS-233-V2-Rev. Section III. Abstracts of Papers Containing Biological Data. Volume 2. 1975, 354p PC$10.50, MF$3.00, supersedes PB-234 882 **PB-254 975/6GA**
FDA/HFF-76/44. FDABF-GRAS-233-V3-Rev. Section IV. Presence and Levels of Reviewed Substances in Foods. Volume 3. 1975, 387p PC$10.75, MF$3.00, supersedes PB-234 883 **PB-254 976/4GA**
FDA/HFF-76/45. FDABF-GRAS-233-V4-Rev. Section IV. Presence and Levels of Reviewed Substances in Foods. Volume 4. 1975, 322p PC$9.75, MF$3.00, supersedes PB-234 884 **PB-254 977/2GA**
FDA/HFF-76/46. FDABF-GRAS-233-V5-Rev. Section IV. Presence and Levels of Reviewed Substances in Foods. Volume 5. 1975, 329p PC$10.00, MF$3.00, supersedes PB-234 885 **PB-254 978/0GA**
FDA/HFF-76/47. FDABF-GRAS-233-V6-Rev. Section V. Bibliography A - K. Volume 6. 1975, 356p PC$10.50, MF$3.00, supersedes PB-234 886 **PB-254 979/8GA**
FDA/HFF-76/48. FDABF-GRAS-233-V7-Rev. Section V. Bibliography L - Z and Supplementary Bibliography. Volume 7. 1975, 376p PC$10.75, MF$3.00, supersedes PB-234 887 **PB-254 980/6GA**

PB-255 146/3GA PC$6.75/MF$3.00
Kraftco Corp., Glenview, Ill. Research and Development Div.
The Treatment of Dairy Plant Wastes.
1973, 152p
Proceedings of Session on Upgrading Dairy Production and Treatment Facilities to Control Pollution Held at Madison, Wis., on 20-21 Mar 73.

Descriptors: *Dairies, *Water pollution control, *Solid waste disposal, *Industrial waste treatment, Concentration(Composition), Byproducts, Material recoveries, Performance evaluation, Sewage treatment, Process charting, Design criteria, Cost estimates, Water analysis, Food processing.
Identifiers: Whey.

Contents:
Current practices in the handling of dairy wastes--(Character of the wastes, Disposing of the effluent, Stockton, Illinois, Norwich, New York, South Edmeston, New York, Champaign, Illinois);
The benefits of the joint treatment approach with the city--(Background, Wastewater treatment plants, The joint approach, The relationship with industry, Sampling and analyses, Summary);
How Dean Foods handles the waste problem at the Chemung, Illinois dairy plant--(In plant controls, The waste treatment plant, The effluent load per 1000 pounds of milk, Performance of the treatment plant, Costs);
Alternate methods of treating or pre-treating dairy plant wastes--(Dairy waste compatibility in municipal, Systems, Selection objectives, Treatment alternatives, Other wastewater treatment alternatives, Treatment methods - summary, Case histories, Kent Cheese Co., Eller Cheese Co., Afolkey Coop Cheese Co.);
Foreign practice reprints--(Pre-treatment of dairy effluent by the Tower system, Biological treatment of dairy wastes, The treatment of creamery and yoghurt, Effluents, Spray disposal of food waste).

PB-255 289/1GA PC$4.00/MF$3.00
Colorado State Univ., Fort Collins. Dept. of Animal Science.
Energy Requirements of Alternate Beef Production Systems.
Final rept.,
Gerald Ward, and Philip Knox. Nov 75, 39p*
NSF/RA/N-75/163
Grant NSF-SIA75-14125

Descriptors: *Beef, *Agricultural economics, Economic surveys, Feeding stuffs, Beef cattle,

Animal husbandry, Livestock, Animal nutrition, Requirements, Energy, Prices, Conservation, Methodology, Production management, Recommendations, Colorado.
Identifiers: Energy conservation, Alternatives.

Though only 3% of the nation's fuel supply is used for agricultural production, this amounts to 8 billion gallons of oil. If some fuel can be conserved in agriculture, along with every other industry, the savings could have a significant effect on our national needs. The principal energy input in beef production is the energy used to produce feed for cattle, in the form of pasture, forage, or grain. Prior to 1950, cattle received most of their feed from forage, but during the 1950's and 60's, with large supplies of cheap grain, grain feeding became more economical. Economy could now dictate a return to forage feeding. This study assesses the energy and protein requirements of the various beef production processes used in Colorado and neighboring states, evaluates the impact of increased energy prices on beef supplies, and determines what methods could be suggested to reduce energy requirements.

PB-255 722/1GA PC$5.50/MF$3.00
Hawaii Univ., Honolulu. Sea Grant Program.
Proceedings of the First Annual Student Symposium on Marine Affairs.
Miscellaneous rept.
Apr 76, 105p UNIHI-SG-MR-76-03, NOAA-76052403
Grant NOAA-04-6-158-44026

Descriptors: *Seafood, *Meetings, Aquaculture, Fishing, Fishes, Ocean environments, Coasts, Water law, Industries, Students, Hawaii.
Identifiers: Law of the Sea, Coastal zone management, Sea Grant program, Aku, Skipjack tuna.

This first volume of the Proceedings of the First Annual Student Symposium on Marine Affairs contains twelve papers in four categories: aquaculture; coastal zone management issues; aku (skipjack) fishery; and the law of the sea issues. Portions of this document are not fully legible.

6I. Hygiene and Sanitation

PB-255 434/3GA PC$4.50/MF$3.00
Virginia Univ., Charlottesville. Dept. of Chemical Engineering.
Enzyme Applications in the Vapor Phase and on Electrically Conducting Surfaces.
Progress rept. for eighteen months,
Donald J. Kirwan. Feb 75, 55p CHE-3893-105-75, NSF/RA/T-75/078
Grant NSF-GI-34772
See also PB-254 313.

Descriptors: *Disinfectants, *Air filters, *Bacteria, *Viruses, Absorbers(Materials), Enzymes, Chemical reactions, Electrochemistry, Carbon electrodes, Electric fields, Surfaces, Trypsin, Design criteria.
Identifiers: *Immobilized enzymes, Enzyme activity, Gas surface interactions.

This report summarizes the recent work in the development of the air disinfection device utilizing enzymes immobilized on glass fiber filters. A patent on this process has been issued and an agreement has been enacted with a company for further development. Effort has been devoted to demonstrating the efficacy of the filter under low humidity conditions. Investigations into using immobilized enzymes to catalyze gas phase reactions has not yet shown feasibility. Initial experiments on the influence of electric fields on immobilized enzymes have shown an activity enhancement for membrane-entrapped hexokinase with applied A.C. potentials. Trypsin, immobilized on porous carbon electrodes, did not respond to an applied D.C. potential, most likely because the reaction was diffusion controlled.

6J. Industrial (Occupational) Medicine

NTIS/PS-76/0599/1GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Mine Safety. Part 3. Occupational Health--General Studies (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Pernell W. Crockett. Jul 76, 135p*
Supersedes NTIS/PS-75/564.

Descriptors: *Bibliographies, *Industrial hygiene, *Mining, *Occupational diseases, *Coal mines, Industrial medicine, Noise reduction, Dust control, Mine ventilation, Injuries, Life support systems, Protection, Safety engineering.

Research reports cited include data on industrial hygiene and occupational hazards in the mining environment. Topics covered are control of noise and respirable dust, mining ventilation, protective equipment and life support systems, and occupational diseases and injuries associated with mining. (This updated bibliography contains 130 abstracts, 20 of which are new entries to the previous edition.)

NTIS/PS-76/0600/7GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Mine Safety. Part 4. Occupational Health-Radioactivity (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Pernell W. Crockett. Jul 76, 72p*
Supersedes NTIS/PS-75/565.

Descriptors: *Bibliographies, *Radiation hazards, *Industrial hygiene, *Mining, *Occupational diseases, Pulmonary neoplasms, Radioactivity, Control, Protection, Mine ventilation, Uranium, Radon isotopes.
Identifiers: *Uranium mines.

Data are presented on radiation hazards in the mining environment. Topics discussed are radiation monitoring, control and protection, mine ventilation, and occupational diseases with special references to lung cancer. Emphasis is given to uranium mining and occupational hazards from radon and decay products. (This updated bibliography contains 69 abstracts, 20 of which are new entries to the previous edition.)

PB-254 272/8GA PC$3.50/MF$3.00
Environmental Protection Agency, Washington, D.C. Office of Pesticide Programs.
Chemical Safety - Pesticides.
Homer R. Wolfe. 19 Jul 74, 24p
Prepared in cooperation with Colorado State Univ., Fort Collins. Inst. of Rural Environmental Health. Proceedings of the Annual Conference of Environmental Chemicals - Human and Animal Health (3rd), Held at Fort Collins, Colorado, July 15-19, 1974.

Descriptors: *Pesticides, *Industrial hygiene, Hazards, Toxicology, Toxicity, Personnel, Education, Safety, Industrial atmospheres, Protective clothing, Protective coverings, Protective masks, Human factors engineering, Respirators, Exposure, Skin(Anatomy), Respiratory systems, Chemical industry.
Identifiers: *Occupational safety and health, *Toxic substances.

People who become involved in activities requiring exposure to pesticides should be aware of the potential hazards involved as a result of absorption of toxic compounds. If a person is knowledgeable about such hazards and understands the importance of taking proper precautions, he can do much to insure the safety of himself and others. Although illnesses resulting from over-exposure to toxic compounds do occur among applicators and other workers, most are a result of carelessness or accident. Experience has shown that if proper precautionary measures are observed and directions on the pesticide label are followed, even the more toxic compounds can be used safely. Exposure to less toxic compounds should not be ignored.

PB-254 580-T/GA PC$3.50/MF$3.00
Environmental Protection Agency, Research Triangle Park, N.C. Translation Services Section.
Present-Day State of Industrial Hygiene Problems in Hydrometallurgical Production of Tungsten and Molybdenum Salts and Oxides (Sovremennoe Sostoianie Voprosov Gigieny Truda pri Gidrometallurgicheskom Sposobe Polucheniya Solei i Okislov Volframa i Molibdena),
L. P. Golyakova. 1971, 11p EPA-TR-76-198
Trans. of Gigiena Truda i Professionalnye Zabolevaniya (USSR) v15 n2 p4-8 1971.

Descriptors: *Industrial hygiene, *Tungsten, *Hydrometallurgy, *Molybdenum oxides, Respiratory diseases, Air pollution, Molybdenum inorganic compounds, Industrial medicine, USSR, Translations, Dust, Exposure.
Identifiers: *Occupational safety and health, Environmental health, *Air pollution effects(Humans).

The paper discusses issues in the hydrometallurgical production of tungsten (W) and molybdenum (Mo) salts and oxides of concern to industrial hygiene. The technology used is briefly described and the main adverse factors in the industry under consideration are pointed out with particular emphasis on the pollution of the atmosphere by dust containing W, Mo and SiO2. High concentrations of irritating gases (NH3, HCl, H2S) were recorded in the air in industrial production areas and work sites. Due to existing work conditions, dust induced fibrosis and a high level of chronic afflictions involving the upper respiratory tract were noted among the workers. The paper compares working conditions at two plants with different mechanized technology levels and demonstrates the importance of advanced technology in the improvement of work hygiene in the industry studied.

PB-254 583-T/GA PC$3.50/MF$3.00
Environmental Protection Agency, Research Triangle Park, N.C. Translation Services Section.
Late After-Effects of Occupational Acute Damage to Respiratory Passages by Irritating Gases (Ob Otdalennykh Posledestviyakh Professionalnykh Ostrykh Porazhenii Dykhatelnykh putey Razdrazhayushchimi Gazami),
N. A. Smirnova, and N. P. Granik. 1971, 8p EPA-TR-76-159
Trans. of Gigiena Truda i Professionalnye Zabolevaniya (USSR) v15 n11 p16-19 1971.

Descriptors: *Toxicity, *Industrial medicine, *Hazardous materials, Carbonyl compounds, Nickel inorganic compounds, Ammonia, Pathology, Respiratory systems, USSR, Translations, Occupational diseases, Formaldehyde, Nitrogen oxides, Industrial hygiene, Toxic diseases, Chlorine, Phosgene, Hydrogen chloride, Gases.
Identifiers: *Occupational safety and health, *Air pollution effects(Humans), Toxic substances, Nickel carbonyls.

It has been established that damage to bronchi is the most frequent late after-effect of intoxication by chlorine, phosgene, oxides of nitrogen and sulfur dioxide. Victims poisoned by these gases subsequently suffer inflammatory processes in the bronchi, bronchiectasis, abscesses, emphysema of the lungs and pneumosclerosis with symptoms of functional respiratory disturbance. These changes caused by chlorine, phosgene and formalin poisoning can appear with attacks of bronchial asthma. In addition, instances are described of more frequent cancer of the lung in persons with occupational pneumosclerosis of toxico-chemical etiology. However, many questions concerning the remote after-effects of acute intoxication by substances irritating respiratory passages are inadequately covered in the literature. Therefore, the purpose of the study was to investigate late after-effects of acute occupational poisonings by several substances which irritate respiratory passages.

PB-254 585-T/GA PC$3.50/MF$3.00
Environmental Protection Agency, Research Triangle Park, N.C. Translation Services Section.
The General Toxic Effect of Shale Resins on Workers (K Voprosu o Obshchetoksicheskom Deistvii Slantsevykh Smol na Organizm Rabochikh),
Kh. A. Kakhn, and A. T. Sillam. 1972, 8p EPA-TR-76-141
Trans. of Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki (USSR) v2 p83-88 1972.

Descriptors: *Toxicity, *Shales, *Industrial medicine, *Hazardous materials, Industrial hygiene, Toxicology, USSR, Translations, Respiratory system, Contact dermatitis, Autonomic nervous system, Immunology, Bronchitis, Hypertension, Respiratory diseases.
Identifiers: *Occupational safety and health, Environmental health, Toxic substances, *Air pollution effects(Humans).

As the authors purpose was to study the effect of shale resins on worker health, an appropriate group was selected and the tests conducted on persons for whom the main occupational agent was shale resin. All workers were examined by an occupational pathologist-therapist and a neuropathologist. Study data were entered on specially devised punch cards. In order to investigate the condition of the autonomic nervous system the authors determined the sensitivity of the skin to ultraviolet rays, sweat production and skin temperature of the digits, hands and feet. Besides clinical analysis of the blood, the authors also determined the content of free and bound phenols, sulfates, glucuronic acids and coproporphyrin in urine.

6K. Life Support

AD-A027 373/9GA PC$3.50/MF$3.00
School of Aerospace Medicine Brooks AFB Tex
A Portable Oxygen System for Aeromedical Crewmembers. An Evaluation.
Interim rept. Jan-Jun 75,
Thomas R. Morgan. Apr 76, 14p Rept no. SAM-TR-76-2

Descriptors: *Oxygen generators, *Life support systems, Oxygen masks, Manportable equipment, Chlorates, Medical personnel, Lightweight, Emergencies, Evacuation, Test and evaluation, Decompression, Acceptability.

An emergency portable oxygen system for aeromedical crewmembers was subjected to a series of manned human compatibility tests. Test conditions included decompression to a simulated cabin altitude of 40,000 feet, with subsequent emergency descent and continuation at 25,000 feet until the system's chlorate-candle oxygen generator was exhausted. Test subjects were satisfactorily oxygenated in all cases, and the unit's external-surface and product-gas temperatures remained acceptable throughout each test. After use, however, each unit experienced melting/failure of the oxygen-mask hose at its junction with the candle assembly's oxygen-delivery tube. A modification rectifying this tendency was derived and satisfactorily tested in subsequent experiments. Problems and advantages inherent to the system's function are discussed in the light of both physiological and anticipated operational effectiveness. (Author)

6L. Medical and Hospital Equipment

AD-A027 495/1GA PC$5.50/MF$3.00
Army Troop Support Command St Louis Mo
Medical Unit, Self-Contained, Transportable Non-Medical Components (MUST - NMC).
System assessment no. 8,
Aubrey A. Yawitz. May 76, 124p

Descriptors: *Health care facilities, Effectiveness, Assessment, Inflatable structures, Life cycle costs, Systems analysis, Shelters, Power supplies.
Identifiers: MUST(Medical units self-contained transportable), Medical units self-contained transportable.

The objective of this study is to present a disciplined review of the Medical Unit, Self-Contained, Transportable (MUST), Non-Medical Components (NMC). The study goal is to measure the effectiveness of the equipment to meet the requirements of its mission, and to determine what actions, if any, are indicated to make the system more effective.

PB-254 675/2GA PC$4.50/MF$3.00
National Academy of Sciences-National Research Council, Washington, D.C. Committee on Prosthetics Research and Development.
Clinical Evaluation of Two Experimental Spinal Orthoses.
Special rept.,
Michael J. Quigley. 1975, 59p* SRS-00727-001
Grant SRS-00727

Descriptors: *Braces, Pain, Therapy, Vertebrae, Medical equipment, Backache, Musculoskeletal disorders, Design, Evaluation.
Identifiers: *Orthoses, *Spinal cord, Biomechanics.

An evaluation of two experimental spinal orthoses was made for patients with chronic low back pain from data gathered from 34 subjects undergoing treatment at 4 hospital centers. Both the Lumbosacral Orthosis with Inflatable Pads (to increase abdominal pressure) and the Lumbosacral Orthosis incorporating a Stimulus to Withdrawal were found to decrease pain in a majority of the patients, and to increase activity in a smaller proportion. Modifications of the orthoses and the procedures are included, and both devices were recommended for use in the treatment of chronic low back pain, when conventional orthotic treatment has proven inadequate.

PB-255 965/5GA PC$5.50/MF$3.00
Orkand Corp., Silver Spring, Md.
An Evaluation of the Administration of the Direct Loan, Loan Guarantee and Mortgage Insurance Programs for Construction and Modernization of Medical Facilities.
Final rept. 28 Jan-28 Jun 76,
Robert M. Clinkscale. 28 Jun 76, 104p TR-76W-048, BHPRD-76/4
Contract PHS-HRA-230-75-0081

Descriptors: *Health care facilities, *Insurance, Hospitals, Renovating, Evaluation, Assessments, Construction, Recommendations, Projects, Tables(Data), Financing, Law(Jurisprudence), Management, Policies.
Identifiers: Hill-Burton projects, Loans, Mortgage insurance.

The purpose of the study is to assess the extent to which HEW organization, technical processes, and staffing of the Title VI (Hill-Burton) and HUD/FHA programs are adequate in terms of program effectiveness and efficiency. Specific attention was directed toward: (1) description of how the program is administered, (2) assessment of overall program organization, (3) evaluation of the strength of the policies and procedures through which program operations are conducted, and (4) assessment of the adequacy of staffing levels required to effectively administer the program. The report presents findings, conclusions and recommendations for each of these area.

PB-255 113/3GA PC$4.00/MF$3.00
Columbia Univ., New York. Artificial Organs Research Lab.
Coordinated Studies of Platelet and Protein Reactions on Artificial Materials.
Annual rept. 1 Nov 75-31 Oct 76,
E. F. Leonard, S. Kochwa, R. S. Litwak, and R. E. Rosenfield. May 76, 30p NIH-N01-HB-3-2910
Contract N01-HB-3-2910
See also PB-241 333.

Descriptors: *Blood proteins, *Platelets, Surface properties, Absorption(Biology), Adhesion, Fibrinogen, Gamma globulin, Serum albumin, Antibodies, Autoradiography, Polymers, Plastics, Silicone resins, Materials, Isotopic labeling.
Identifiers: *Biomaterials, *Blood compatible materials.

Comparative studies are reported for 15 surfaces on which the adhesion of blood platelets and the adsorption of the proteins albumin, gamma globulin, and fibrinogen was measured. The surfaces were prepared as discs which were spun either in pools of canine blood anticoagulated with heparin or in about 1 mg/ml solutions of one of the proteins (human) in saline. Platelet adhesion was determined by counting through the microscope, en face; protein adsorption was determined by using 125I radiolabelled proteins whose adsorption was determined by counting of the surfaces after exposure and washing. Experiments were conducted over periods ranging from 0.5 min to 15 min and significant differences in rates of uptake were noted among the materials. A technique for obtaining autoradiographs of adsorbed protein layers was developed and applied to some of the test surfaces. Qualitative inspection showed large, generally random variations over all surfaces. In a companion study of a more fundamental nature, the kinetics of protein adsorption and the enzymatic desorption of fibrinogen were studied.

PB-255 654/6GA PC$3.50/MF$3.00
Washington Univ., Seattle. School of Medicine.
Study of Hyperlipidemia and Atherogenesis.
Annual progress rept. 18 Jun 74 - 17 Jun 75,
John D. Bagdade. 14 Jan 75, 13p AK-3-73-2212
Contract N01-AM-3-2212
See also PB-234 500.

Descriptors: *Lipid metabolism, *Vascular diseases, *Dialysis, Artificial kidneys, Patients, Urinary diseases, Uremia, Blood, Mechanical organs, Rats, Models, Laboratory animals, Physiology, Surgical transplantation, Lipoproteins, Corticosteroids.
Identifiers: *Hyperlipidemia, *Atherogenesis.

Survival of both dialysis and renal transplant patients is significantly shortened by premature cardiovascular disease. Since these patients also have a high frequency of hyperlipidemia, a well known cardiovascular risk factor in the

non-renal population, studies were carried out in chronically uremic and renal transplant patients and in animals to determine how hyperlipidemia might relate to vascular disease. Chronically uremic rats developed hyperlipidemia without significant quantitative alterations in lipoprotein production or lipoprotein lipase (LPL), suggesting the possibility that impaired lipoprotein catabolism in uremia might result from an inhibitor in uremic plasma which modifies LPL function. The possibility of delayed catabolism was supported by finding an enrichment of triglyceride in both VLDL and LDL in both undialyzed and dialyzed chronically uremic patients. Steroid-treated animals were found to have significantly reduced LPL suggesting that renal transplant hyperlipidemia results principally from impaired VLDL removal.

PB-255 708/0GA PC$4.50/MF$3.00
Jet Propulsion Lab., Pasadena, Calif.
Effects of the Physiological Environment on the Long-Term Physical Performance of Polymeric Materials.
Annual rept. Dec 74-Nov 75,
J. Moacanin, R. Fedors, J. Ingham, E. Cuddihy, and D. D. Lawson. 22 Apr 76, 69p JPL-5040-31, NIH-Y01-HV-30011-3
Grant PHS-HV-30011
See also report dated 28 Apr 75, PB-243 753.

Descriptors: *Urethanes, *Elastomers, *Mechanical organs, *Prosthetic devices, Gels, Mechanical hearts, Ethanols, Physiological effects, Mechanical properties, Medical equipment, Implantation, Stability, Durability, Tensile strength.
Identifiers: *Biomaterials, *Blood compatible materials.

An evaluation of the mechanical properties of a class of segmented polyether urethanes was completed. This included a study of the effects on properties of the extraction of the polymer with ethanol as well as of the details of conditions during casting. Thermal stability studies on the elastomer using mass spectrometer analyses for volatiles indicated reasonable resistance to steam sterilization. Studies were initiated on the surface erosion of hydrogel and carbon-coated surfaces using a rotating disc device. Methods for observing surface charges were developed.

6M. Microbiology:

AD-A027 342/5GA PC$3.50/MF$3.00
Naval Medical Research Unit No 3 Fpo New York 09527
Complement-Fixing and Indirect Fluorescent Antibodies in Sera of Dogs Experimentally Infected with 'Babesia gibsoni',
Technical rept.,
Boulos A. M. Botros, and R. R. Maronpot. 1974, 10p Rept no. NAMRU-3-TR-4-76
Availability: Pub. in J. Egypt Vet. Med. Ass. v34 n3-4 p309-321 1974.

Descriptors: *Parasitic diseases, Serodiagnosis, Complement(Biology), Dogs, Fluorescent antibody techniques, Antigens and antibodies, Veterinary medicine, Reprints.
Identifiers: Babesia gibsoni, Theileria, Complement fixation tests.

Measurable levels of complement-fixing and indirect fluorescent antibodies were present in the sera of all dogs 10 days after inoculation with B. gibsoni parasites. Antibody titers rose rapidly and remained high for over 7 months. Although both the CF and the IFA tests yield similar titers, the IFA test was easier to perform and could be completed in a shorter time than the CF test. (Author)

AD-A027 494/4GA PC$3.50/MF$3.00
Naval Medical Research Unit No 3 Fpo New York 09527
Blood Parasites in Egyptian Domestic Animals.
Technical scientific rept.,
R. R. Maronpot, S. A. Michael, and Boulos A. M. Botros. 1974, 9p Rept no. NAMRU-3-TR-3-76
Availability: Pub. in Jnl. of the Egyptian Veterinary Medical Association, v34 n3-4 p301-308 1974.

Descriptors: *Parasitic diseases, *Domestic animals, Epidemiology, Sheep, Bovines, Horses, Erythrocytes, Reservoirs, Egypt, Reprints.
Identifiers: Babesia, Theileria, Camels, Donkeys, Anaplasma.

There were low prevalences of Babesia infection in sheep, cattle and buffalo from all areas of Egypt sampled. Prevalence of Theileria infection was considerably greater and reached 53.4% in cattle from El Minya. One out of 12 camels had Theileria in his peripheral red blood cells. Examined donkeys and horses did not have blood parasites. These results document a significant reservoir of Theileria carriers and a smaller reservoir of Babesia carriers.

AD-A027 606/3GA PC$3.50/MF$3.00
Naval Medical Research Unit No 2 Apo San Francisco 96263
'Toxoplasma' Antibodies in Indonesian and Chinese Medical Students in Jakarta.
Technical rept.,
Felix Partono, and John H. Cross. 1975, 9p Rept no. NAMRU-2-TR-690
Availability: Pub. in the Southeast Asian Jnl. of Tropical Medicine and Public Health, v6 n4 p472-476 Dec 75.

Descriptors: *Toxoplasma, Epidemiology, Antibodies, Serodiagnosis, Questionnaires, Blood analysis, Ethnic groups, Medical personnel, Indonesia, China, Reprints.

The presence of antibodies to Toxoplasma gondii in medical students of Indonesian and Chinese ancestry was determined by the indirect hemagglutination test with titers of 1:256 or greater considered positive. The sera from 90 Indonesian and 203 Chinese male (146) and female (147) students between 20 and 30 years of age were tested and positive titers detected in the sera of 16 (18%) Indonesians and 14 (7%) of the Chinese. There were no difference between the presence of positive titer and between males and females of either ethnic groups. Both groups denied eating raw or partly cooked meats and no correlation could be found between the ownership of domestic cats, the eating of exotic meats and positive titers. (Author)

AD-A027 611/3GA PC$3.50/MF$3.00
Naval Medical Research Unit No 2 Apo San Francisco 96263
Preliminary Study of Attenuated Japanese Encephalitis Virus,
G. Chin-Yun Lee, Yun-Tsung Huang, and Lien-Chin Chang. 16 Sep 75, 11p Rept no. NAMRU-2-CS-95
Availability: Pub. in Jnl. Formosan Medical Association, 74 p808-812 1975.

Descriptors: *Japanese encephalitis viruses, *Live vaccines, Antibodies, Hamsters, Tissue culture, Cultures(Biology), Interferon, Chickens, Virulence, Reprints.

An attenuated strain of Japanese encephalitis virus, TWN-21, was derived from the parent strain, HV-1, by 17 continuous passages in hamster diploid cell cultures and purified by isolation of a least virulent clone. The strain is characterized by low neurovirulence in suckling mice. It produces small plaques in MK2 cell culture, provokes complete cellular destruction in primary chick embryo fibroblast monolayers, and elicits high interferon titers in chick embryo fibroblasts when compared with the parent strain. The TWN-21 strain, in newborn chicks, produced low and irregular viremias; but was fully as antigenic as the parent strain. After injection into pigs, transient low grade viremias occurred in 4 of 12 animals, but the strain produced high antibody titers in all. Immunized pigs were subsequently completely protected from natural infection. (Author)

PB-255 256/0GA PC$3.50/MF$3.00
Environmental Protection Agency, Denver, Colo. Technical Support Branch.
Bacteriological Survey of the Cache La Poudre River Near Greeley, Colorado, April, 1972.
Nov 72, 21p SA/TSB-5

Descriptors: *Cache La Poudre River, *Bacteria, Surveys, Standards, Microbiology, Water pollution, Effluents, Tables(Data).
Identifiers: Water quality data, *Greeley(Colorado), Appendices.

Two brief microbiological studies of the Cache La Poudre River in the Greeley, Colorado, area were conducted during April, 1972, to: (1) identify the source(s) of bacterial pollution in the reach bracketed by the foot-bridge crossing at Island Grove Park and the low head dam at 2nd Avenue; (2) develop some insight to the relative impact of storm runoff on the bacteriological quality of the river in the Greeley area. Although bacteriological degradation of the river in the Island Grove Park - 2nd Avenue reach was identified in EPA studies conducted during the last half of 1971, the source or sources were not identified since these studies were designed to assess the effect of Great Western's sugar factory effluent on water quality.

6N. Personnel Selection and Maintenance (Medical)

AD-A027 345/9GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Anthropometric Data Presented in Three-Dimensional Forms,
Milton Alexander, Robert S. Zeigen, and Irvin Emanuel. 1961, 13p ASD-TR-61-599
Availability: Pub. in The American Jnl. of Physical Anthropology, V19 n2 p147-157 Jun 61.

Descriptors: *Anthropometry, Protective clothing, Headgear, Helmets, Three dimensional, G Suits, Oxygen masks, Human factors engineering, Sizes(Dimensions), Experimental design, Fittings, Models, Reprints.

The Anthropology Section, Aeronautical Systems Division, has used as well as standard approaches in the attempt to translate anthropometric data into three-dimensional forms. Basic anthropometric data must be interpreted for the designer and engineer prior to their application to practical problems. Considerable confusion exists among designers and engineers when it comes to handling anthropometric data for items of close-fitting protective equipment, e.g., pressure suits, oxygen masks and helmets. In the past, various head and body forms have been fabricated to provide the designers with more concrete expressions of anthropometric data. Recent efforts along these lines have led to the development of new three-dimensional forms, some of general application and others for specific problems. The design rationale on which these forms are based and the difficulties encountered in sculpturing them to dimension are discussed.

6O. Pharmacology

AD-A027 344/1GA PC$3.50/MF$3.00
School of Aerospace Medicine Brooks AFB Tex.
Cardiovascular Effects of Enflurane and Halothane on the Rhesus Monkey.
John R. Ritzman, Howard H. Erickson, and Edward D. Miller, Jr. 20 Jun 75, 10p Rept no. SAM-TR-75-297
Contract NASA-A-94544
Presented at Congress of the International Anesthesia Research Society (49th) 16-20 Mar 75, Hollywood, Fla.
Availability: Pub in Anesthesia and Analgesia, Current Researches, v55 n1 p85-91 Jan-Feb 76.

Descriptors: *Anesthetics, *Cardiovascular system, Blood flow, Anesthesia, Blood pressure, Heart rate, Inhalation, Rhesus monkeys, Statistical analysis, Reprints.
Identifiers: Halothane, Enflurane, Physiological effects.

Ten rhesus monkeys were chronically instrumented to compare the cardiovascular effects of enflurane and halothane. In seventeen experiments, each monkey was evaluated in the awake state and after equilibration at each of many anesthetic levels. End expired gas concentrations were expressed in multiples of human minimum alveolar concentrations (MAC) for comparison. There was a predictable, dose-related decrease in heart rate, mean arterial pressure and peak left ventricular dp/dt. Central venous pressure was increased by both. At equal MAC levels, no significant differences were detected between halothane and enflurane. Cardiac output and aortic flow acceleration were obtained on one of the animals for both agents. Results were consistent with those for the other measured parameters.

NTIS/PS-76/0505/6GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Psychotropic Drug Research (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
Pernell W. Crockett. Jul 76, 145p*
Supersedes NTIS/PS-75/489.

Descriptors: *Bibliographies, *Psychoneuropharmacology, Pharmacology, Hypnotics and sedatives, General anesthetics, Tranquilizer drugs, Alcohols, Amphetamines, Caffeine, Hallucinogenic drugs, Drugs.

Research reports are cited on the pharmacology of hypnotics and sedatives, anesthetics, tranquilizers, alcohols, amphetamines, caffeine, and hallucinogens. (This updated bibliography contains 140 abstracts, 26 of which are new entries to the previous edition). See also NTIS/PS-75/147, Drug Abuse.

6P. Physiology

AD-A027 615/4GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Sweating Responses During Change of Hypothalamic Temperature in the Rhesus Monkey.
Kenneth A. Smiles, Reynaldo S. Elizondo, and Christopher C. Barney. 16 May 75, 6p Rept no. AMRL-TR-75-41
Grant AF-AFOSR-2473-73
Availability: Pub. in Jnl. of Applied Physiology, v40 n5 p653-657 May 76.

Descriptors: *Temperature control, *Sweat cooling, *Hypothalamus, Brain, Biological control, Rhesus monkeys, Evaporation, Perspiration, Temperature, Skin(Anatomy), Body temperature, Response(Biology), Sweat glands, Reprints.

A technique is presented for preparing a durable thermode implant in the hypothalamus of the rhesus monkey. In unanesthetized monkeys implanted with thermodes in the anterior hypothalamic area of the brain, a linear relation was found between local sweat rates on the general body surface and clamped hypothalamic temperature. Changes in skin temperature were found to shift the hypothalamic set-point temperature at which sweating began but did not alter the gain of the hypothalamic temperature-sweat rate relationship. This study provides direct support for the concept that central brain temperature and skin temperature interact additively in the control of sweating in higher primates.

NTIS/PS-76/0634/6GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Electroretinography (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Pernell W. Crockett. Aug 76, 94p*
Supersedes NTIS/PS-75/526.

Descriptors: *Bibliographies, *Electroretinography, Electrophysiology, Retina, Eye(Anatomy), Physiology, Dark adaptation, Color vision, Visual perception, Radiation effects.

Research reports are cited on the use of electroretinography to study physiological processes of the eye. Studies are included on dark adaptation, color vision, visually evoked responses, visual performance, and radiation effects. (This updated bibliography contains 89 abstracts, 2 of which are new entries to the previous edition.)

PB-254 505/1GA PC$3.50/MF$3.00
Maryland Univ., College Park. Dept. of Electrical Engineering.
A Model of Cochlear Transduction. Final Technical Letter Report.
Final rept. 1 Apr 74-30 Sep 75,
J. Robert Boston. Mar 76, 15p TR-30-8-76
Grant NSF-ENG74-09783

Descriptors: *Cochlea, *Senses, Microphonics, Nerve cells, Auditory perception, Electrophysiology, Models, Stimulus(Psychophysiology), Fishes.
Identifiers: *Cochlear microphonics, Fundulus heteroclitus.

Measurements of the microphonic potential from the lateral line sensory organs of killifish (Fundulus heteroclitus) are presented in this report. The potential consists of a d-c shift and a dominant oscillatory component at twice the frequency of the stimulus, and it grows with the square of the stimulus at low amplitudes. An electrical circuit model of the microphonic is developed, assuming a simple quadratic nonlinearity in the electrical response of an individual hair cell. It is concluded that hair cell microphonics appear to be generated by a process involving current flow through a variable conductance, although capacitive effects of the hair cell are important in determining the waveform of the microphonic and its behavior as a function of frequency.

PB-255 894/2GA PC$3.50/MF$3.00
Emory Univ., Atlanta, Ga. Dept. of Physiology.
Preservation of Granulocytes for Transfusion.
Annual rept. no. 2, 15 Jun 75-14 Jun 76,
Vojin Popovic. 25 Jun 76, 24p NIH-N01-HB-4-2950-2
Contract N01-HB-4-2950

Descriptors: *Leukocytes, *Blood preservation, Objectives, Blood transfusion, Blood cells, Cryogenics, Isolation, Freezing, In vivo analysis, In vitro analysis, Cells(Biology).
Identifiers: Cryopreservation, *Granulocytes, Animal models.

The goals of the work are to develop the most efficient methods for granulocyte preservation by freezing in dextrose-dimethyl sulfoxide, storage at -176C and thawing by a microwave technique in a specially constructed chamber. Improved electromagnetic techniques for thawing frozen granulocytes have been already developed in the laboratory. Successful thawing rates and waveforms were achieved for concentrated granulocytes alone and for granulocytes with various combinations and concentrations of DMSO, PVP, EDTA, and Heparin. Granulocyte viability improved from a few percent in early experiments to as high as 68 percent in later experiments. The phagocytic and bacteriocidal function of granulocytes by in vitro and in vivo techniques in animals and in humans was tested. The rats made transiently neutropenic were infected with E. coli and had a mortality rate of 90% within 48 hours post infection. Multiple transfusions of large numbers of granulocytes (harvested from Deca-Durabolin treated donor rats) protected the neutropenic animals from sepsis.

PB-255 915/1GA PC$4.00/MF$3.00
Utah Univ., Salt Lake City. Div. of Artificial Organs.
Effects of Hemolysis, Coagulation, and Recirculation of Single and Double Needle Hemodialysis.
Final rept. 17 Jun 74-16 Jun 75,
E. Hershgold, R. Kirkham, C. Hadfield, and W. J. Kolff. Dec 75, 32p AK-1-4-2210
Contract N01-AM-4-2210

Descriptors: *Hemolysis, *Coagulation, *Circulation, *Artificial kidneys, Physiological effects, Mechanical organs, Blood, Platelets, Patients, Tables(Data), Methodology.
Identifiers: *Hemodialysis, Chronic disease management.

The study was designed to examine alterations in the clotting system and degree of recirculation with single needle hemodialysis. There was no significant change in platelet function or number with single needle dialysis. The recirculation averaged 14.1% with a range from 5.5% - 25.4%.

6Q. Protective Equipment

AD-A027 211/2GA PC$3.50/MF$3.00
Navy Clothing and Textile Research Facility Natick Mass
Aluminized Firemen's (Fire Proximity) Handwear: A Comparative Study of Dexterity Characteristics.
Technical rept. Nov 75-Jun 76,
Francis S. Andruk, James C. Shampine, and Dale A. Reins. Jul 76, 25p TR-121/5-76, DOD-AGFSRS-76-17

Descriptors: *Fire protective clothing, *Gloves, Hands, Motion, Touch, Efficiency, Mobility, Textiles, Aluminum, Human factors engineering, Fire fighting.

A comparative study of the tactility and dexterity characteristics of several configurations of aluminized firemen's (fire proximity) handwear was conducted. The old standard aluminized firemen's glove was compared with that of the recently adopted two component (glove shell and glove insert) standard and a newly developed experimental prototype, which was prepared in three models (MOD-I, MOD-II and MOD-III) for this study. The manipulatory capabilities of all the gloves were measured against the ungloved or bare hand, and the results indicated that MOD-III of the new experimental prototype exceeded that of the old and new standard and came closest in performance to the ungloved hand.

6R. Radiobiology

AD-A027 513/1GA PC$4.00/MF$3.00
IIT Research Inst Chicago Ill
Sanguine/Seafarer Extremely Low Frequency Electromagnetic Fields: Effect of Long-Term Exposure on Soil Arthropods in Nature.
Bernard Greenberg. Jul 76, 45p
Contract N00039-73-C-0030
Prepared in cooperation with Illinois Univ., Chicago. Dept. of Biological Sciences.

Descriptors: *Radiation effects, *Electromagnetic radiation, *Extremely low frequency, Long range(Time), Exposure(Physiology), Arthropoda, Growth(Physiology), Circadian rhythms, Mites, Statistical analysis, Vegetation, Plants(Botany), Population.
Identifiers: Radiation effects(Biology), Collembola, Cryptostigmata, Project seafarer, Project sanguine.

A study of the long-term biological impact of extremely low frequency (ELF) non-ionizing electromagnetic radiation was continued at the Navy's Wisconsin Test Facility. Population analyses of soil arthropods and a floral survey were performed on nine exposed and six control plots. Comparisons with floral surveys taken three or four years earlier suggest normal vegetational changes and succession in exposed plots and environs. Phenomena observed in the exposed and control plots are of a shared nature and thus tend to exclude an ELF electromagnetic radiation effect. Data observed to date do not support the hypothesis that low-level non-ionizing ELF electromagnetic fields have had a demonstrable impact on populations of soil arthropods and surrounding flora after six years of exposure. (Author)

NTIS/PS-76/0612/2GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Radiation Effects on Cells and Chromosomes (A Bibliography with Abstracts).
Rept. for 1964-Aug 76,
Pernell W. Crockett. Aug 76, 131p*
Supersedes NTIS/PS-75/551.

Descriptors: *Bibliographies, *Radiation effects, *Cells(Biology), *Chromosomes, Cytology, Cytochemistry, Genetics, Radiotherapy, Malignant neoplasms, Radiobiology.
Identifiers: Cancer.

Reports on the effects of radiation on cell physiology, chemistry, and genetics are cited. Mechanisms of radiotherapy on cancerous cells are discussed. (This updated bibliography contains 126 abstracts, 24 of which are new entries to the previous edition.)

N76-25796/3GA PC$4.00/MF$3.00
Nebraska Univ., Lincoln.
Health Protection and Food Preservation by gamma Irradiation.
Final Report, May 1976.
May 76, 33p NASA-CR-147779
Contract NAS9-11045

Descriptors: *Food, *Gamma rays, *Irradiation, *Space flight feeding, Apollo spacecraft, Molds, Pasteurizing, Public health, Space missions.

For abstract, see STAR 1416

PATENT-3 959 653 Not available NTIS
Department of Health, Education, and Welfare, Washington, D.C.
Fast Charge Digitizer and Digital Data Acquisition System for Measuring Time Varying Radiation Fields.
Patent,
Thomas R. Lee, Roger H. Schneider, and John L. Wyatt. Filed 14 Apr 75, patented 25 May 76, 10p PB-255 364/2, PAT-APPL-567 719
Supersedes PB-242 145.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Radiation measuring instruments, *Dosimeters, *Patents, Analog to digital converters, Data acquisition, X rays, Ionization chambers, Digital systems, Display devices.
Identifiers: PAT-CL-250-374, Time varying systems.

The patent provides a radiation measuring instrument for use in obtaining and displaying digital representations of time varying X-ray fields. In operation, the entire system measures simultaneously the instantaneous exposure rate, total exposure, and exposure time.

PB-254 759/4GA PC$4.50/MF$3.00
Office of Telecommunications Policy, Washington, D.C.
Program for Control of Electromagnetic Pollution of the Environment: The Assessment of Biological Hazards of Nonionizing Electromagnetic Radiation.
Annual rept. no. 1, Jan-Dec 72.
Mar 73, 67p OTP-76/006
See also report dated May 74, PB-254 760.

Descriptors: *Electromagnetic radiation, *Health physics, *Radiation effects, *Radiobiology, Environments, Radioactive contaminants, Tables(Data), Assessments, Telecommunication, Radio waves.
Identifiers: *Environmental health, Microwave radiobiology, Electromagnetic radiation hazards, Appendices, Nonionizing radiation.

The report concerns unintended effects on man and his environment from the purposeful use of nonionizing electromagnetic radiations such as are associated with the use of telecommunications devices (e.g., radio waves).

PB-254 760/2GA PC$4.00/MF$3.00
Office of Telecommunications Policy, Washington, D.C.
Program for Control of Electromagnetic Pollution of the Environment: The Assessment of Biological Hazards of Nonionizing Electromagnetic Radiation.
Annual rept. no. 2, Jan-Dec 73.
May 74, 47p OTP-76/007
See also report dated Mar 73, PB-254 759 and report dated Apr 75, PB-254 761.

Descriptors: *Electromagnetic radiation, *Health physics, *Radiation effects, *Radiobiology, Environments, Radioactive contaminants, Assessments, Research, Tables(Data), Telecommunication, Radio waves, Documents.
Identifiers: *Environmental health, Microwave radiobiology, Electromagnetic radiation hazards, Appendices, Nonionizing radiation.

The report summarizes activities over the past year (1973) associated with the Federal Government's multiagency program, being coordinated by the Office of Telecommunications Policy (OTP), to assess the biological effects of nonionizing electromagnetic radiation. It covers the period following that reported by OTP in March 1973. This program was recommended by the Electromagnetic Radiation Management Advisory Council (ERMAC) which was established in 1968-69 to advise the Director, Telecommunications Policy, on possible side effects and the adequacy of control of electromagnetic radiations associated with the use of the spectrum. The purpose of this cooperative undertaking is to ensure the well being of man and his environment without unnecessarily restricting his use of the electromagnetic spectrum and the many benefits it provides.

PB-254 761/0GA PC$5.00/MF$3.00
Office of Telecommunications Policy, Washington, D.C.
Program for Control of Electromagnetic Pollution of the Environment: The Assessment of Biological Hazards of Nonionizing Electromagnetic Radiation.
Annual rept. no. 3, Jan-Dec 74.
Apr 75, 93p OTP-76/008
See also report dated May 74, PB-254 760.

Descriptors: *Electromagnetic radiation, *Health physics, *Radiation effects, *Radiobiology, Environments, Radioactive contaminants, Tables(Data), Assessments, Telecommunication, Radio waves.
Identifiers: *Environmental health, Microwave radiobiology, Electromagnetic radiation hazards, Appendices, Nonionizing radiation.

The primary emphasis of the Program is on the study of exposures at relatively low power density levels over extended periods of time, and the effects of different electromagnetic conditions. The Program objectives are: to determine what effects these radiations have on living organisms under different conditions of exposure; to determine the clinical significance associated with any observed effects and assess the potential hazards, if any, with reference to realistic exposure environments; to establish a sound scientific basis for appropriate remedial and/or control measures which may appear warranted.

PB-255 459/0GA PC$4.00/MF$3.00
Smithsonian Science Information Exchange, Inc., Washington, D.C. Current Cancer Research Project Analysis Center.
Current Cancer Research on Radiation Carcinogenesis.
15 Jun 76, 26p NIH/NCI/ICRDB-76/0615

Descriptors: *Malignant neoplasms, *Radiation, *Health physics, Occupational diseases, Research, Directories, Epidemiology, Laboratory models, Populations, Exposure, Abstracts, Patients, Authors.
Identifiers: Animal models, *Cancer, *Carcinogenesis, Occupational safety and health, Environmental health.

The listing is one of a planned series produced by the Current Cancer Research Project Analysis Center (CCRESPAC) for the International Cancer Research Data Bank (ICRDB) Program of the National Cancer Institute. The purpose of the series is to inform cancer investigators of ongoing projects related to their current research in laboratories all over the world. Each listing focuses on a specific cancer research area. Information on the listed projects was derived from descriptions supplied to CCRESPAC by cancer investigators and research organizations. This listing (Special Listing of Current Cancer Research on Radiation Carcinogenesis) covers projects related to occupational radiation carcinogenesis, cancer risk in populations exposed to therapeutic or diagnostic radiation or to radioactive fallout, radiation carcinogenesis in animal model systems, mechanisms of radiation carcinogenesis, and cancer induction by radiation in combination with carcinogenic agents (chemicals or hormones).

6S. Stress Physiology

AD-A027 172/8GA PC$6.00/MF$3.00
Undersea Medical Society Bethesda Md
Proceedings of the Undersea Medical society Workshop (5th) on Diving Data Banks held at

Naval Submarine Medical Research Laboratory Naval Submarine Base, Groton, Connecticut on 5-6 February 1974,
Claude A. Harvey, and James W. Parker. Feb 74, 136p Rept no. WS-2-15-76
Contract N00014-74-C-0319
See also Rept. no. Ws-7-1-75 dated 1975, AD-A018 474.

Descriptors: *Diving, *Data banks, *Information systems, Meetings, Information retrieval, Deep Diving, Computers, Human factors engineering, Hyperbaric conditions, Decompression, International relations, Systems approach, Computer applications, Great Britain.
Identifiers: *Meetings.

This report presents the information exchanged in the Fifth Undersea Medical Society Workshop DIVING DATA BANKS, held at the Naval Submarine Research Laboratory, Naval Submarine Base, Groton, Connecticut on 5-6 Febuary 1974. The report covered the following: Existing Data Banks, Search and Retrieval Sophistication: Computer Uses and Abuses, Potential Pathways of Data Bank Utilization, Conclusions and Recommendations.

AD-A027 548/7GA PC$3.50/MF$3.00
Army Research Inst of Environmental Medicine Natick Mass
Heat and Simulated High Altitude: Effects on Biochemical Indices of Stress and Performance.
Ralph P. Francesconi, Bernard J. Fine, and John L. Kobrick. 1976, 7p Rept no. USARIEM-M-16/76
Availability: Pub. in Aviation, Space and Environmental Medicine, v47 n5 p548-552 1976.

Descriptors: *Biosynthesis, *Stress(Physiology), Adverse conditions, High altitude, Exposure(Physiology), High temperature, Thermal stresses, Recruits, Military personnel, Performance(Human), Simulation, Blood analysis, Enzymes, Dopamine, Adenosine phosphates, Humidity, Cholesterol, Cortisol, Uric acid, Cyclic compounds, Reprints.
Identifiers: Dopamine Beta hydroxylase.

Five healthy, military test volunteers were alternately exposed on separate days to sea level, control conditions (22-23 C, 40-50% RH), a hot, wet environment (35 deg C, 90% RH) or simulated high altitude (4300 m, 22-23 C, 20-30% RH) while carrying out assigned performance tasks. Acute exposure of 7 h to environmental heat consistently elicited significant increments in plasma levels of cortisol, dopamine-beta-hydroxylase, and uric acid while cholesterol and cyclic AMP levels were unaffected. Alternatively, exposure to altitude for the same duration failed to effect significant alterations in any of the aforementioned biochemical factors. Although both environmental stresses caused similar performance decrements, the responses of biochemical indices of stress were consistently related to the environment itself. (Author)

AD-A027 602/5GA PC$7.75/MF$3.00
Hawaii Univ Honolulu Dept of Physiology
Quantification of Heat Loss from Various Routes in Man Dwelling in a Wet/Dry Hyperbaric Environment.
Final rept. 1 May 72-31 Aug 75,
Terance O. Moore, and James F. Morlock. 1 Jun 76, 216p
Contract N00014-67-A-0387-0016

Descriptors: *Stress(Physiology), *Diving, *Heat loss, *Hyperbaric conditions, Respiration, Heat exchangers, Exercise(Physiology), Body temperature, Quantitative analysis, Equations, Mathematical analysis, Predictions.

Respiratory and whole body heat losses have been quantified and predictive equations have been derived for diving conditions of depth, gas density, gas mix, ambient and immersion water temperatures, and work levels.

AD-A027 612/1GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Involuntary Head Movements and Helmet Motions During Centrifuge Runs with Up to +8Gz,
K. H. E. Kroemer, and Kenneth W. Kennedy. 1973, 8p Rept no. AMRL-TR-72-40
Availability: Pub. in Aerospace Medicine, v44 n6 p639-644 Jun 73.

Descriptors: *Stress(Physiology), *Acceleration, *Head(Anatomy), Flight helmets, Reticles, Angular motion, Centrifuges, Stability, Eye, Displacement, Gravity, Aerospace medicine, Reprints.

Open-loop centrifuge runs reaching +8Gz were performed with 13 subjects wearing the foam-padded standard HGU-2A/P helmet. Weights up to 20 oz. were attached at top and sides. During the centrifuge runs, each subject attempted to maintain his gaze at a target directly in front of him. Hence, no voluntary motion of the head should have occurred. Position of the head, of the helmet, and of a helmet-attached reticle were recorded photographically at each G-level. From the photographs, data on actual displacements of head, helmet, and reticle were extracted and subjected to a computer-aided analysis. Involuntary angular head movements, as well as rotational displacements of the helmet on the head, are discussed in this paper in terms of pitch, roll and yaw. Also described are linear changes in the vertical height of the subjects' eyes and of the reticle. Yaw and roll were found to be small and unstructured. Fore-and-down head and helmet pitch, and depression of eye and reticle were about proportional to the amount of +Gz-stress. (Author)

AD-A027 614/7GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Head and Neck Cooling by Air, Water, or Air Plus Water in Hyperthermia,
Abbott T. Kissen, Walter C. Summers, Willi J. Buehring, Milton Alexander, and David C. Smedley. 1975, 9p Rept no. AMRL-TR-75-38
Availability: Pub. in Aviation, Space, and Environmental Medicine, v47 n3 p265-271 Mar 76.

Descriptors: *Hyperthermia, *Flight helmets, *Cooling, Exposure(Physiology), Body temperature, Ventilation, Human factors engineering, Temperature control, Skin(Anatomy), Rectum, Heart rate, Perspiration, Performance(Human), Optical tracking, Heat stress(Physiology), Head(Anatomy), Water cooling, Air cooled, Comparison, Operators(Personnel), Linings, Simulation, Reprints.

The effects of air, water, and air plus water head cooling on thermoregulatory responses and human operator performance were studied in nonacclimatized, heat-exposed men. Forty chamber exposures (46 C, 30 mm Hg water vapor pressure) were conducted under non-cooled and the aforementioned subconditions of head cooling. Five subjects, exposed for 80 min, were monitored for mean skin and rectal temperatures, heart rate, sweat loss, and compensatory tracking performance. A modified Air Force helmet shell provided facial air ventilation (24 C) at 8 cfm. Eight interconnected neoprene modules fastened beneath a helmet liner provided water cooling (20 C at 0.9 l/min). Tracking performance was unchanged across conditions. Elevation of rectal temperature and heart rate, sweat loss, and Physiological Index of Strain were significantly reduced by each condition of head cooling. Air is as effective as water as a cooling agent. Air ventilation acts synergistically with water cooling in reducing physiological strain. Relative merits of each approach to head cooling, in an operational context, are discussed. (Author)

AD-A027 617/0GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Bradycardia Induced by Negative Acceleration,
James A. Kennealy, John S. Kirkland, and Ronald E. Sneider. 1976, 3p Rept no. AMRL-TR-76-9
Availability: Pub. in Aviation, Space, and Environmental Medicine, v47 n5 p483-484 May 76.

Descriptors: *Deceleration, *Stress(Physiology), Aviation medicine, Bradycardia, Humans, Centrifuges, Heart, Electrocardiography, Safety belts, Gravity, Acceleration, Reprints.

Four volunteers were subjected to negative acceleration in a human centrifuge for the purpose of testing a standard lap belt. Three subjects developed a sinus bradycardia. The fourth developed a sinus arrest with a junctional rhythm at -2 G. With return to +1 G, the sinus mechanism recovered with a prolonged P-R interval. Within 2 h, the P-R interval returned to normal. Negative acceleration maneuvers, well within the capabilities of high-performance aircraft, can effect marked changes in the cardiac rhythm. This phenomenon appears to be vagally induced and is remarkably well tolerated. (Author)

AD-A027 626/1GA PC$3.50/MF$3.00
Office of Naval Research London (England)
Workshop on the Treatment of Decompression Sickness.
Conference rept.,
K. M. Greene. 12 Jul 76, 9p Rept no. ONRL-C-18-76

Descriptors: *Decompression sickness, *Diving, Workshops(Meetings), Breathing gases, Drugs, Treatment, North Sea, Medical technicians.
Identifiers: Recompression, Great Britain.

This report summarizes a workshop held 17-18 February 1976 in London. The thirty physicians attending from seven nations sought a uniform approach to the treatment of decompression sickness in the North Sea environment. Aspects considered include recompression profiles, gas mixtures, ancillary drugs, aftercare, qualification of assistants, and communication problems. Included in the report is an outline approved by the EUBS for guidance in the choice of treatment tables. (Author)

AD-A027 641/0GA PC$3.50/MF$3.00
Texas A and M Research Foundation College Station
The Effect of Elevated Oxygen Tension on Red Cell Function and Integrity.
Final rept. Jan 72 - Jun 74,
John M. Prescott, Lee E. Ray, and John P. Cherry. Dec 75, 25p SAM-TR-75-41
Contract F41609-72-C-0003

Descriptors: *Hyperoxia, *Erythrocytes, Stress(Physiology), Oxygen, Enzymes, Proteins, Rabbits, Electrophoresis, Membranes(Biology), Exposure(Physiology), Toxicity, Chemical kinetics, pH Factor.
Identifiers: Glutathione reductase.

The effects of elevated oxygen tension, both hypobaric and hyperbaric, on membrane proteins and glutathione reductase of rabbit erythrocytes were investigated. Gel electrophoretic analysis revealed no discernible changes in the protein patterns of erythrocyte membranes of animals exposed to hyperoxia.

Both hyperbaric and hypobaric oxygen caused a slight decrease in the glutathione reductase activity in comparison with that of control animals, but the extent of the effect was not directly proportional to the product of the duration and intensity of exposure. Rather, a threshold oxygen level was suggested. No detectable changes in erythrocyte or leukocyte counts resulted from hyperoxia. Glutathione reductase was isolated in homogeneous state from rabbit erythrocytes and was found to be a monomer with a molecular weight of 60,000. Either NADPH or NADH was capable of reducing GSSG. The enzyme revealed substrate inhibition and was inhibited by p-hydroxymercuribenzoate under certain conditions.

AD-A027 663/4GA PC$3.50/MF$3.00
Army Aeromedical Research Lab Fort Rucker Ala
Dynamic Visual Acuity in Fatigued Pilots.
Final rept.,
Isaac Behar, K. A. Kimball, and D. A. Anderson. Jun 76, 15p Rept no. USAARL-76-24

Descriptors: *Optical tracking, *Visual acuity, *Sleep Deprivation, Pilots, Fatigue(Physiology), Target detection, Performance(Human), Eye movements, Helicopters, Correlation techniques, Visual perception.

Six rotary wing aviators were subjects in a continuous operation regimen involving some 12 hours of flying and 3.5 hours sleep daily for five days. Estimates of performance on a dynamic visual acuity (DVA) task were obtained several times each day during the study using target velocities of 25 deg. and 40 deg./sec. DVA performance varied significantly during the fatigue regimen when measurements were made with target velocities of 40 deg./sec; with lower velocity targets differences in DVA scores were not significant. This indicates the need to tax the oculomotor system to demonstrate fatigue effects. Fatigue effects were partially obscured by practice effects which are considerable in the DVA task. DVA scores correlated only modestly with subjective estimates of fatigue intensity and flying performance, and IP ratings of performance, but the cluster of correlations provided a consistent picture. (Author)

AD-A027 715/2GA PC$4.00/MF$3.00
Mayo Foundation Rochester Minn Dept of Physiology and Biophysics
Protection of the Cardiopulmonary Systems Against the Injurious Effects of Acceleration.
Annual progress rept. 1 Jul 74-30 Jun 75,
Peter A. Chevalier. Jun 75, 36p AFOSR-TR-76-0689
Contract F44620-71-C-0069
See also report dated 1974, AD-A000 480.

Descriptors: *Acceleration tolerance, *Stress(Physiology), *Lung, Cardiovascular system, Respiratory system, Ventilation(Physiology), Edema, Blood volume, Respiration, Biomechanics, Anatomy, Elastic properties, Radiography, Images, Markers.
Identifiers: *Cardiopulmonary function.

Research accomplished during the period centered primarily on the application of recently developed pulmonary parenchymal markers and three-dimensional transaxial reconstruction techniques to the study of the spatial distribution of lung parenchymal strains, regional lung volumes and lung geometry. The development of these marker techniques provide a unique research tool. The data described in this report represent significant new information regarding regional mechanical properties of the lung and clearly indicate the need to study the intrinsic elastic behavior in order to quantitate dynamic changes.

N76-28781/7GA PC$10.00/MF$3.00
Methodist Hospital, Houston, Tex.
Report of 14-Day Bedrest Simulation of Skylab.
P. C. Johnson, and C. Mitchell. 7 Jun 76, 331p
NASA-CR-147758
Contract NAS9-14578

Descriptors: *Aerospace medicine, *Bed rest, *Skylab program, Gravitational effects, Physiological effects, Physiological responses, Physiological tests, Weightlessness.

For abstract, see STAR 1416

N76-25762/5GA PC$4.00/MF$3.00
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
Electromyographic Analysis of Skeletal Muscle Changes Arising from 9 Days of Weightlessness in the APOLLO-Soyuz Space Mission.
E. V. Lafevers, Apr 76, 36p NASA-TM-X-58177, JSC-10876
Subm-Prepared in Part by Technology Inc., Houston, Tex.

Descriptors: *Electromyography, *Muscular fatigue, Excitation, Human reactions, Measure and integration, Myoelectric potentials, Physiological tests, Spectrum analysis, Weightlessness.

For abstract, see STAR 1416

PB-254 821/2GA PC$6.75/MF$3.00
California Univ., Santa Barbara. Inst. of Environmental Stress.
Influence of Carbon Monoxide on Cardiac Dynamics in Normal and Cardiovascular Stressed Animals.
Final rept. 1 Jul 71-31 May 74,
Steven M. Horvath. 1975, 151p* ARB-R-2096-75-51
Contract ARB-2096

Descriptors: *Carbon monoxide, *Heart function tests, *Coronary artery disease, Exercise(Physiology), Cardiovascular system, Heart diseases, Stress(Physiology), Hypoxia, Oxygen consumption, Blood flow, Dogs, Laboratory animals, Experimental data, Blood chemical analysis, Humans, Physiological effects.
Identifiers: Carbonylhemoglobin, *Environmental health, *Air pollution effects(Humans).

Carbon monoxide inhalation by normal animals resulting in increased levels of carboxyhemoglobin (6 to 35%) increased coronary blood flow, decreased availability of oxygen to the myocardium (heart muscle), and decreased the oxygen tensions of both arterial and coronary sinus blood. Animals with myocardial disturbances, acquired complete atrioventricular block, failed to respond to a low level of HbCO (6 to 7%) as had normal animals. Disappearance of carbon monoxide from blood was biphasic, with an initial rapid rate followed by a slower rate which was partially dependent upon the absolute level of carboxyhemoglobin. Animals performing submaximal levels of work showed minor impairments in cardiovascular function. Animals chronically exposed to ambient air having 100 ppm of carbon monoxide responded to an acute exposure of CO which raised the level of HbCO to the same degree (10%) as was present at the end of each daily exposure had cardiorespiratory responses similar to those observed in non-exposed animals.

6T. Toxicology

AD-A027 594/1GA PC$4.50/MF$3.00
California Univ Irvine
JP-4 and JP-9 Fuel Toxicity Studies using Fresh Water Fish and Aufwuchs.
Annual research rept. 1 Jun 74-31 May 75,
Stephen Klein, Robert Cooper, and David Jenkins. Jun 76, 68p AMRL-TR-76-50
Contract F33615-73-C-4059

Descriptors: *Jet engine fuels, *Toxicity, *Water pollution, Emulsions, Eggs, Methyl radicals, Cyclohexanes, Exposure(Physiology), Lethal dosage, Solubility, Fishes, Bioassay, Trout, Aquatic organisms, Gas chromatography, Accumulation.
Identifiers: Aquatic toxicity, JP-4 fuel, JP-9 fuel, Methylcyclohexanes, RJ-4 fuel, RJ-5 fuel, Aufwuchs, Notemigonus chrysoleneas, Jordanella floridae, Salmo gairdneri.

This report contains the results of research efforts concerned with defining the effects of potential environmental contamination resulting from the use of certain Air Force materials on fresh water fish and aufwuchs. Materials evaluated include RJ-4, RJ-5, Methylcyclohexane, JP-9 and JP-4. Techniques for exposing organisms to those substances are discussed and the results of such exposures are presented. (Author)

NTISUB/B/033-76/001
Mag Tape $200.00;Foreign $250.00
Food and Drug Administration, Bethesda, Md. Div. of Poison Control.
Poison Control Inquiry Data Base. June 1970-July 1976.
Data file,
George Armstrong, and Susan Nicholson. Jul 76, mag tape* FDA/BD-76/83, FDA/DF-76/002
Source tape is in EBCDIC character set. Tape can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions. Also available on subscription as NTISUB/B/033.

Descriptors: *Data file, *Toxicity, Magnetic tapes, Data storage, Toxicology, Data.

The tape contains data relating to trade names, manufacturers, symptoms, toxicity, etc. of approximately 10,000 household products. The data file is the Poison Control Inquiry data base as of June 1, 1976. It contains 106038 records.

PB-254 576-T/GA PC$3.50/MF$3.00
Environmental Protection Agency, Research Triangle Park, N.C. Translation Services Section.
Experimental and in vivo Studies of the Toxicity of a Group of Phthalate Plasticizers,
L. A. Timofievskaya, and M. V. Aldyreva. 1972, 5p EPA-TR-76-203
Trans. of mono. Eksperimentalnye Issledovaniya Toksichnosti Gruppy Ftalatnykh Plastifikatorov, Moscow, 1972 p206-207.

Descriptors: *Toxicity, *Phthalates, *Plasticizers, Industrial atmospheres, Industrial medicine, In vivo analysis, Toxicology, Experimental data, Translations, USSR, Humans, Air pollution, Exposure, Responses, Laboratory animals, Dose rate, Lethal dosage, Permissible dosage, Toxic tolerances.
Identifiers: Maximum permissible exposure, Occupational safety and health, Air sampling, *Air pollution effects(Humans), Environmental health.

Analyses of the air made to determine the concentrations of various toxic compounds used in the mix formulas, have shown that phthalate plasticizers occupy a leading position among them. The highest concentrations were determined at the work sites of the roll mill operators, calendar machine operators and coating machine operators. Carbon monoxide, hydrogen chloride, vinyl chloride and also polyvinyl chloride resin dust, lead and cadmium compounds were detected in small amounts in

the air at the production areas along with the plasticiters. In addition, the air temperature in the production sites mentioned (in the vicinity of the roll mills and calendar machines) is higher during the operations, while the physical stress varies. The toxicity of a group of phthalate plasticiters (dimethyl-, diethyl-, dibutyl- and dioctyl phthalates) along the various paths through which they enter the organism was investigated along with the studies made in vivo in the plant.

PB-255 394/9GA PC$3.50
Rhode Island Univ., Kingston. Dept. of Pharmacognosy.
Presence of Four Toxins in Red Tide Infested Clams and Cultured 'Gonyaulax tamarensis' Cells.
Yuzuru Shimizu, Maktoob Alam, Yasukatsu Oshima, and William E. Fallon. 25 Jul 75, 9p
Marine Reprint-49, NOAA-76032601
Grant PHS-FD-00619
Pub. in Biochemical and Biophysical Research Communications, v66 n2 p731-737 1975.

Descriptors: *Toxins and antitoxins, *Clams, *Shellfish, *Algae, Poisons, Aquatic animals, Aquatic biology, Isolation, Chromatography, Toxicity.
Identifiers: Reprints, Mya arenaria, *Gonyaulax tamarensis, Sea Grant program, *Red tide, Dinoflagellata, Algal blooms, Atlantic coast(United States), *Paralytic shellfish poisons, Saxitoxin.

Four toxins have been isolated by Sephadex G-15 and high pressure ion exchange chromatography from the soft shell clams, Mya arenaria, which were collected during 1972 and 1974 red tide outbreaks on the New England coast. One of the toxins was saxitoxin and the rest seem to be new toxins. The same toxins were isolated from the extract of cultured Gonyaulax tamarensis.

PB-255 432/7GA PC$4.00/MF$3.00
Syracuse Univ. Research Corp., N.Y. Life Sciences Div.
Effects, Uptake, and Metabolism of Methoxychlor, Mirex, and 2,4-D in Seaweeds.
Final rept. May 73-Oct 75,
Harish C. Sikka, Gary L. Butler, and Clifford P. Rice. Jun 76, 49p EPA/600/3-76/048
Contract EPA-68-03-0271

Descriptors: *DDT, *Insecticides, *Algae, *Toxicity, Plant physiology, Chlorine aliphatic compounds, Chlorine organic compounds, Metabolism, Chlorine aromatic compounds, Pesticides, Herbicides, Recommendations, Tables(Data), Physiological effects, Toxicology, Cultures(Biology), Estuaries, Phytoplankton, Water pollution, Aquatic plants.
Identifiers: Rhodymenia, Mirex, Methenocyclobuta (cd) pentalenes, *Seaweeds, Ulva, *Water pollution effects(Plants), Acetic acid/2-4-dichlorophenoxy, D 2-4 herbicide, Enteromorpha, Bioaccumulation, Metabolites.

The report presents the results of a study concerning effects, uptake, and metabolism of mirex, methoxychlor, and 2,4-D in the seaweeds Ulva sp., Enteromorpha sp., and Rhodymenia sp. None of the pesticides, at concentrations corresponding to their maximum solubility in seawater, had any significant effect on photosynthesis, protein, carbohydrate, lipid, chlorophyll, carotenoid or trace metal content of the algae. All three algae removed substantial amounts of mirex and methoxychlor from the medium, but uptake of 2,4-D was extremely low. The rate of uptake of methoxychlor was considerably greater than that of mirex. Enteromorpha accumulated considerably more mirex and methoxychlor than Ulva or Rhodymenia. Both Ulva and Enteromorpha failed to metabolize either mirex or 2,4-D. Enteromorpha metabolized methoxychlor to a limited extent. After 7 days of incubation with carbon-labelled methoxychlor, a major portion of the label in the tissue and medium was present in unchanged methoxychlor. A small amount of radioactive metabolite, 2,2-bis (p-methoxyphenyl)-1, 1-dichloroethylene, was detected in both the tissue and medium.

7. CHEMISTRY

7A. Chemical Engineering

AD-A027 329/2GA PC$6.75/MF$3.00
Rensselaer Polytechnic Inst Troy N Y
Treatment of a Wastewater from Military Explosives and Propellants Production Industry by Physicochemical Processes.
Final project rept. 1 Apr-30 Jun 76,
Lawrence K. Wang, William W. Shuster, Ray W. Shade, and Thomas J. Lynch. Jun 76, 169p Rept no. RPI-JBA02-2
Contract DAAG53-75-C-0252
See also report dated Mar 76, AD-A023 602.

Descriptors: *Water pollution, *Nitrocellulose, *Polymers, Explosives, Propellants, Munitions industry, Manufacturing, Colloids, Sedimentation, Filtration, Centrifuge separation, Carbon, Absorbers(Materials), Particles, Polyelectrolytes, Coagulation, Activated carbon, Laboratory equipment, pH factor.
Identifiers: *Industrial waste treatment, *Water pollution control, Chemical removal(Water treatment).

Laboratory and pilot-plant studies were conducted to investigate the effectiveness of various physical-chemical processes for the separation of nitrocellulose (i.e., cellulose nitrate) from a military wastewater. Special emphasis was placed on in-line filtration (i.e., contact coagulation-filtration), pre-coat filtration and conventional multimedia filtration. In-line filtration involves adding a cationic polyelectrolyte (Cat-Floc) and the military wastewater directly to the filter simultaneously. In pre-coat filtration, the filter media is coated with cationic polyelectrolyte prior to the filtration of the wastewater. It was found that neither in-line filtration nor pre-coat filtration was effective for separating nitrocellulose fine particles from the wastewater. Conventional treatment system uses mixing, flocculation and settling in separate reactor(s) followed by filtration of the settler's supernatant. Another treatment method involving centrifugation was also investigated. Although direct centrifugation of the raw nitrocellulose-manufacturing wastewater could not reduce any turbidity, the combination of chemical coagulation (using cationic polyelectrolyte as coagulant and appropriate material as coagulant aid) and centrifugation could achieve more than 98% of turbidity removal.

AD-A027 330/0GA PC$4.50/MF$3.00
Rensselaer Polytechnic Inst Troy N Y
Role of Polyelectrolytes in the Filtration of Colloidal Particles from Water and Wastewater.
Final project rept. 15 Jun 75-30 Jun 76,
William W. Shuster, and Lawrence K. Wang. Jun 76, 60p Rept no. RPI-JBA02-3
Contract DAAG53-75-C-0252
See also report dated Jun 76, AD-A027 329.

Descriptors: *Water pollution, *Water treatment, *Sewage treatment, *Polyelectrolytes, *Polymers, Colloids, Filtration, Separation, Particles, Coagulation, Filters, Drinking water.
Identifiers: *Industrial waste treatment, *Water pollution control.

An extensive review has been made of the literature in connection with the use of polyelectrolytes in the removal of colloidal particles from water and wastewater by mechanisms of filtration. Pertinent literature on the nature of colloidal materials and current theory related to particle interactions and coagulation has been briefly reviewed. Present thought on the physical aspects and the chemical aspects of filtration has been considered. References related to the characterization and behavior of multi-media filters as well as single media filters were included in this work. Particular attention was directed to the review and evaluation of articles related to specific applications of the use of polyelectrolytes in water treatment, and in domestic and industrial wastewater treatment.

AD-A027 625/3GA PC$3.50/MF$3.00
Office of Naval Research London (England)
International Symposium on Fresh Water from the Sea (5th) 16-20 May 76.
Robert H. Nunn. 8 Jul 76, 16p Rept no. ONRL-C-17-76

Descriptors: *Desalination, *Sea water, Fresh water, Foreign technology, Evaporation, Distillation, Freezing, Reverse osmosis, Fluidized bed processes, Economics, Energy management, Fuel consumption, Symposia.
Identifiers: Great Britain.

This report summarizes the nature and scope of this conference, held in Sardinia, which attracted some 495 delegates from 34 countries on 16-20 May 1976. The subject-coverage of the symposium is briefly reviewed, and a somewhat more complete description is given of the sessions of regional reviews, economics, and of the use of fluidized beds in evaporative systems. Economy was emphasized in the conference, with major implications regarding the future of multi-stage flash evaporation systems in the presence of rising fuel costs.

NTIS/PS-76/0652/8GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Waste Treatment by Reverse Osmosis and Membrane Processes (Citations from the NTIS Data Base).
Rept. for 1964-Jun 76,
Kirk G. Werner, and Diane Cavagnaro. Aug 76, 150p*
Supersedes NTIS/PS-75/574, and NTIS/PS-75/017. See also NTIS/PS-76/0653, and NTIS/PS-76/0654.

Descriptors: *Bibliographies, *Industrial waste treatment, *Sewage treatment, *Electrodialysis, *Water pollution control, Performance evaluation, Design criteria, Membranes, Osmosis, Abstracts, Dialysis.
Identifiers: *Reverse osmosis, *Ultrafiltration.

Citations of Federally-funded research cover the treatment of sewage and industrial wastes by reverse osmosis, ultrafiltration, electrodialysis and other osmotic processes. Desalting of ground, surface, and sea waters is excluded. (This updated bibliography contains 145 abstracts, 28 of which are new entries to the previous edition.)

NTIS/PS-76/0653/6GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Waste Treatment by Reverse Osmosis and Membrane Processes. Part 1. Sewage (Citations from the Engineering Index Data Base).
Rept. for 1970-Jul 76,
Diane M. Cavagnaro. Aug 76, 69p*
See also NTIS/PS-76/0652.

Descriptors: *Bibliographies, *Sewage treatment, *Electrodialysis, *Water pollution control, Performance evaluation, Design criteria, Membranes, Osmosis, Abstracts, Dialysis.

Identifiers: *Reverse osmosis, *Ultrafiltration.

Worldwide research is cited on the treatment of sewage by osmosis, ultrafiltration, electrodialysis, and other osmotic processes. Studies are included on design, performance, and the versatility of many of these membranes with respect to their use. (Contains 62 abstracts)

NTIS/PS-76/0654/4GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Waste Treatment by Reverse Osmosis and Membrane Processes. Part 2. Industrial (Citations from the Engineering Index Data Base).
Rept. for 1970-Jul 76,
Diane M. Cavagnaro. Aug 76, 244p*
See also NTIS/PS-76/0652.

Descriptors: *Bibliographies, *Industrial waste treatment, *Electrodialysis, *Water pollution control, Performance evaluation, Physical properties, Design criteria, Membranes, Osmosis, Abstracts, Dialysis.
Identifiers: *Reverse osmosis, *Ultrafiltration.

These citations on worldwide research discuss the use of membranes used in industrial waste water treatment. The membrane systems include reverse osmosis, ultrafiltration, electrodialysis, ultrathin, and other osmotic processes. Research is included on the development of the membranes, physical properties, fabrication, and their performance. Desalination processes of natural water are excluded. (Contains 239 abstracts)

PATENT-3 967 948 Not available NTIS
Tennessee Valley Authority, Muscle Shoals, Ala.
Purification of Phosphoric Acid with Urea and Nitric Acid.
Patent,
John F. McCullough. Filed 29 Sep 75, patented 6 Jul 76, 9p PB-255 482/2, PAT-APPL-617 699
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Phosphoric acid, Nitric acid, Purification, Nitrogen inorganic compounds, Urea, Inorganic solutions, Fertilizers.
Identifiers: PAT-CL-71-29, Phosphoric acid plants.

The invention relates to a new method for purification of wet-process phosphoric acid with co-production of nitrogen solution. The crude acid is treated with urea by known processes to form urea phosphate free of most of the impurities in the crude acid. The urea phosphate is treated with concentrated nitric acid to form solid urea nitrate and phosphoric acid. The purified phosphoric acid is separated from the urea nitrate and withdrawn as product. The urea nitrate is washed with concentrated nitric acid and the wash solution then is used for reaction with urea phosphate. The washed urea nitrate is then treated with ammonia and water to form nitrogen solution.

PB-254 554-T/GA PC$3.50/MF$3.00
Environmental Protection Agency, Research Triangle Park, N.C. Translation Services Section.
Combined Production of Starch and Alcohol in Alcohol Plants (Kombinirovanie Proizvodstva Krakhmala i Spirta na Spirtovykh Zavodakh),
M. E. Burman, and E. I. Yurchenko. 1958, 10p EPA-TR-76-217
Trans. of Spirtovaya Promyshlenost (USSR) v24 n5 p18-22 1958.

Descriptors: *Starches, *Alcohols, *Chemical industry, *Potatoes, Translations, USSR, Utilization, Industrial plants, Process charting, Costs, Manufacturing.
Identifiers: Agricultural products.

The starch-syrup industry is an important part of the national economy: syrup and glucose are valuable sugar products used in the confectionary and bakery industries and in the production of medicine; starch and dextrin serve as auxiliary materials in the textile, light and meat industries and in a number of machine-building and chemical industries. The problem could be solved several ways, the most important of which is remodelling existing maize-processing plants and building in southern regions of the USSR a number of new giant combines with a capacity of processing 100-450 T of maize per day. The specific properties of potato starch are responsible for its primary value as a food product (in the form of dry jellies, pudding flour, etc.). In connection with which potato raw material should primarily be turned to the production of starch and grain used for syrup and glucose. The production of potato starch will require building a number of new plants, primarily of small capacity, in eastern regions of the RSFSR.

PB-255 094/5GA PC$4.00/MF$3.00
Midwest Research Inst., Kansas City, Mo.
Evaluation of Magnetics for Fine Particle Control.
Final task rept. Feb 75-Feb 76,
K. P. Ananth, and L. J. Shannon. May 76, 34p EPA/600/2-76/133
Contract EPA-68-02-1324

Descriptors: *Particles, *Air pollution control, *Magnetic forces, Fines, Performance evaluation, Separation, Agglomeration, Concentration(Composition), Particle sizes, Aerosols, Industrial wastes, Combustion products, Dust control.

The report gives results of an evaluation of the effectiveness of magnetic agglomeration/separation techniques in enhancing fine particulate capture. Whereas residence times and magnetic fields required to achieve agglomeration via magnetic forces appear to be unrealistic, magnetic separation--especially high gradient magnetic separation--appears to be attractive in principle.

PB-255 500/1GA PC$7.75/MF$3.00
Burns and Roe Construction Corp., Paramus, N.J.
Material Evaluation and Development Program, OSW San Diego Test Facility.
Final rept.
May 73, 223p W76-10552, , OWRT/S-76/50
Contract DI-14-30-3014

Descriptors: *Desalting, *Corrosion prevention, Distillation, Alloy steels, Copper, Tables(Data), Construction materials, Brines, Ultrasonic frequencies, Electrochemistry.
Identifiers: *Desalination plants, San Diego Test Facility, Multistage flash distillation, Vertical tube evaporation, Laboratory tests.

Four plants at the San Diego Test Facility (SDTF) were studied for corrosion effects during 1972. The Clair Engle Plant (CEP) was the principal plant for corrosion and coatings testing. The methods of corrosion testing were ultrasonic wall thickness measurements, coupons, Corrater, and Corrosometer (these last two are electro-chemical devices). The results correlated well between the different techniques. Intensive corrosion data obtained in the CEP, Effect 1-A plant (E1A) multi-stage flash module (Module), and Vertical Tube Evaporator (VTEX) showed high carbon steel corrosion in all areas, particularly in the E1A and VTEX. From the results of observations and tests on materials at the SDTF, a list of recommended materials of construction for future distillation plants has been compiled. Color illustrations reproduced in black and white.

PB-255 501/9GA PC$8.00/MF$3.00
Burns and Roe Construction Corp., Paramus, N.J.
Horizontal Spray Film (HTEX) and Vertical Tube (VTEX) Evaporator, OSW San Diego Test Facility.
Final rept.
May 73, 236p W76-10553, , OWRT/S-76/49
Contract DI-14-30-3014

Descriptors: *Desalting, Evaporators, Performance evaluation, Design criteria, Heat transfer, Brines, Process charting, Thin films, Cost estimates, Spraying.
Identifiers: *Desalination plants, *Horizontal tube evaporation, *Vertical tube evaporation, San Diego Test Facility.

To investigate and verify horizontal tube evaporation (HTME) performance, construction was begun on the horizontal tube evaporator test vehicle (HTEX) at the San Diego Test Facility. The plant was designed and built by Aqua-Chem, Inc. This report summarizes the work carried out at the HTEX, since completion of the unit in October 1972. As a result of the phaseout of the San Diego Test Facility, performance testing was carried out on a 7-day, 3-shift basis to permit maximum data recovery. All performance data were obtained during the month of February 1973. HTEX operations ceased on March 2, 1973. The overall evaluation of the HTEX indicates the horizontal tube spray film process for seawater evaporation is very stable, feasible, and has a greater potential than the multi-stage flash distillation (MSF) process because the overall heat transfer coefficients for smooth tubes are about twice those of the MSF process and it suffers no submergence or nonequilibrium losses. The shell cost and therefore coating costs in the HTME are lower, and smaller pumps are required compared to the large recycle pumps in the MSF process. The HTME process is superior to the vertical tube multiple effect process if the premium price for the double fluted tube in the VTE is high. The HTME process still has however some problems, such as uniformly distributing the brine spray over large bundles, and uniformly distributing the vapor over the tubesheet in a large bundle.

PB-255 582/9GA PC$9.25/MF$3.00
National Field Investigations Center-Denver, Colo.
Waste Treatment and Disposal Methods for the Pharmaceutical Industry.
E. J. Struzeski, Jr. Mar 75, 295p EPA/330/1-75/001

Descriptors: *Drug industry, *Industrial waste treatment, *Water pollution control, Organic compounds, Process charting, Manufacturing, Design criteria, Effluents, Fermentation, Sludge, Formulation, Filters, Anaerobic conditions, Materials recovery, Distillation, Toxicity, Nitrogen organic compounds, Byproducts, Waste disposal, Heavy metals, Solid waste disposal, Sewage treatment.
Identifiers: Biological industrial waste treatment, Liquid waste disposal.

Contents:
- Industry categorization--(Standard industrial classification, Kline guide, Gulf South Research Institute, National Field Investigations Center-Denver);
- Process description--(Unit processes, Typical plant operations);
- Waste characteristics--(Fermentation, Synthesized organic chemicals, Biologicals, Drug formulation, Waste parameters of significance, BOD;

a question of reliability, Toxicity, Nitrogen reduction);
Waste recovery and control--(Solvent recovery, Byproduct recovery-antibiotics production, Byproduct recovery-technological transfer, Wastewater reduction and recovery methods);
Waste treatment and disposal--(Activated sludge, Trickling filtration, Other treatment methods);
Development of effluent limitations--Exemplary plant, Available treatment and disposal processes, Model systems, Effluent limitations, Bibliography, Case histories of the pharmaceutical industry).

7B. Inorganic Chemistry

AD-A027 316/9GA PC$3.50/MF$3.00
Brown Univ Providence R I Dept of Chemistry
High-Pressure Synthesis and Properties of NiPS,
R. Henry, a. Wold, H. Nahigian, and J. Steger. 6 Apr 75, 4p ARO-6079.31-MC
Grant DA-ARO-D-31-124-73-G13
Availability: Pub. in Inorganic Chemistry, v14 n12 p2912-2914 1975.

Descriptors: Nickel compounds, Phosphorus compounds, Sulfides, *Synthesis(Chemistry), High pressure, Electrons, Crystal structure, Permeability(Magnetic), Electrical resistivity, High temperature, Chemical properties, X Ray diffraction, Chemical Bonds, Chemical reactions, Chemical analysis, Thermogravimetric analysis, Reprints.
Identifiers: *Nickel phosphide sulfides.

NiPS was synthesized at 60 kbars pressure and 1300 C using a high-pressure belt apparatus. The X-ray diffraction patterns obtained from pure NiPS can be indexed assuming a cubic pyrite type structure. The cubic cell dimension was 5.549 (2) A and a density of 4.75 (2) g/cu m. was determined by a hydrostatic technique. Magnetic susceptibility and resistivity measurements indicate that the nickel cations can be assigned a low-spin d(7) electronic configuration. No spontaneous magnetism was observed over the temperature range from 100 to 540K. (Author)

PATENT-3 962 498 Not available NTIS
Department of the Interior, Washington, D.C.
Dehydration of Magnesium Chloride.
Patent,
Henry Dolezal. Filed 14 Jul 75, patented 8 Jun 76, 3p PB-255 378/2, PAT-APPL-595 902
Supersedes PB-245 353.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Magnesium chlorides, *Dehydration, *Patents, Hydrates, Brines, Amine salts, Magnesium.
Identifiers: Amine hydrochloride, PAT-CL-423-498.

A method for dehydrating magnesium chloride hydrates or brines by complexing with amine hydrochlorides is described. Magnesium chloride hydrate or brine is reacted with an amine hydrochloride to form a complex which is then heated to first drive off water and then at a higher temperature to decompose the anhydrous complex into anhydrous magnesium chloride and amine hydrochloride. Any magnesium oxides present in the starting material is converted to the chloride by reaction with the HCl present.

PB-256 207/3GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
The Isolation and Characterization of Pentafluorodisilane.
Final rept.,
J. F. Bald, Jr., and K. G. Sharp. 29 Apr 73, 4p
Prepared in cooperation with Pennsylvania Univ., Philadelphia. John Harrison Lab. of Chemistry. Pub. in Jnl. of Fluorine Chemistry Short Commun., v3 p433-435 1973-74.

Descriptors: *Synthesis(Chemistry), *Chemical analysis, Decomposition reactions, Physical properties, Thermal stability, Chemical properties, Bromides, Fluorine inorganic compounds, Nuclear magnetic resonance, Pyrolysis, Mass spectroscopy, Disilanes, Separation, Distillation.
Identifiers: *Disilane/bromo-tetrafluoro, Reprints, Disilane/pentafluoro.

The primary product of the reaction between hydrogen bromide and silicon difluoride, SiF2, has been shown to be 1-bromo-1,1,2,2,-tetrafluorodisilane, SiF2HSiF2Br (I). This compound decomposes spontaneously at room temperature with pentafluorodisilane, Si2F5H (II) as the primary product. A more efficient source of (II) involves fluorination of the Si-Br bond in (I) with antimony trifluoride, SbF3. Isolation of (II) can be effected by multiple runs on a low temperature distillation column. The physical properties of (II) have been determined and are discussed, as are the infrared, (1)H and (19)F nmr and mass spectra. The thermal stability and several chemical characteristics of (II) have also been investigated. Specific experiments which are discussed involve the pyrolytic and base-catalyzed decompositions of (II).

7C. Organic Chemistry

AD-A027 368/9GA PC$3.50/MF$3.00
Army Materials and Mechanics Research Center Watertown Mass
Nucleophilic Substitution of Cyclic and Polymeric Dichlorophosphazenes with M-Chlorophenoxide.
Final rept.,
Bernard R. LaLiberte, and Gary L. Hagnauer. Jun 76, 21p Rept no. AMMRC-TR-76-17

Descriptors: *Phosphazene, *Chlorine compounds, *Polymers, *Heat resistant plastics, Synthesis(Chemistry), Substitution reactions, Physical properties, Thermal stability, Molecular structure, Ethers, Phosphonitrile chlorides, Organic phosphorus compounds.
Identifiers: Nucleophilic reactions, Poly(nitrilo-phosphoranylylidene).

The effects of reaction conditions on the nucleophilic substitution of cyclic and polymeric dichlorophosphazenes with m-chlorophenoxide are investigated. Reaction conditions are established which guarantee complete substitution of the polymer. Also it was found that the substitution reaction is influential in controlling macromolecular structure. Reaction conditions were determined whereby insoluble polydichlorophosphazene could be completely substituted with m-chlorophenoxide. Temperature is an important parameter for the substitution reaction. The physical properties of partially substituted poly(bis(m-chlorophenoxy)phosphazene) are quite different from the fully substituted polymer. The thermal stability of poly(bis(m-chlorophenoxy)phosphazene) is related to its extent of substitution. (Author)

AD-A027 603/9GA PC$3.50/MF$3.00
Purdue Univ Lafayette Ind Richard B Wetherill Lab
Selective Reductions. XXI. 9-Borabicyclo(3.3.1) Nonane in Tetrahydrofuran as a New Selective Reducing Agent in Organic Synthesis. Reaction with Selected Organic Compounds Containing Representative Functional Groups,
Herbert C. Brown, S. Krishnamurthy, and Nung Min Yoon. 19 Jan 76, 17p ARO-11437.3-C
Grant DA-ARO-D-31-124-73-G148
Presented at the Great Lakes Regional Meeting of the American Chemical Society (8th) Jun 74, West Lafayette, Ind. See also Ad-645 574.
Availability: Pub. in Jn1. of Organic Chemistry, v41 n10 p1778-1791 1976.

Descriptors: *Cycloalkanes, *Boron compounds, *Reduction(Chemistry), *Reaction kinetics, *Synthesis(Chemistry), Furans, Chemical reactions, Polycyclic compounds, Borohydrides, Reprints.
Identifiers: Furan/tetrahydro, Reducing agents, *Bora-bicyclo(3-3-1)nonanes.

The approximate rates, stoichiometry, and products of the reaction of 9-borabicyclo(3.31) nonane (9-BBN) with selected organic compounds containing representative functional groups under standard conditions (tetrahydrofuran, 25 C) were determined in order to establish the utility of the reagent as a selective reducing agent. Primary, secondary, and tertiary alcohols and simple phenols evolve hydrogen rapidly and quantitatively. However, 2,6-ditert-butylphenol is inert to this reagent even at 65 C. Reaction with n-hexylamine and thiols is quite sluggish. Aldehydes and ketones of diverse structure are reduced rapidly and quantitatively to give the corresponding alcohols in excellent yields. However, the highly hindered ketone 2,2,4,4-tetramethyl-3-pentanone is quite inert even at 65 C. Reduction of 2-methylcyclohexanone give 40% cis- and 60% trans-2-methylcyclohexanol, respectively. Cinnamaldehyde is rapidly and cleanly reduced to cinnamyl alcohol; it undergoes further hydroboration very slowly,. Anthraquinone is cleanly reduced to 9,10-dihydro-9,10-anthracenediol in 79% yield. Carboxylic acids liberate hydrogen rapidly and quantitatively and further reduction is very slow. However, in refluxing THF n-oxtanoic acid is reduced to n-octyl alcohol quantitatively in 24 h. Acid chlorides are reduced rapidly and quantitatively to the corresponding alcohols. Esters are reduced at a moderate rate at room temperature. However, at 65 C complete reduction can be achieved in 4 h gamma Butyrolactone is reduced to 1,4-butanediol at a moderate rate whereas the reduction of phthalide is very slow. Both n-octyl bromide and p-bromotoluene are inert toward his reagent.

AD-A027 604/9GA PC$3.50/MF$3.00
Utah State Univ Logan Dept of Chemistry and Biochemistry
Photoreactions of Tetrafluorodiphosphine with partially Fluorinated Ethenes,
W. Kent Glanville, Joseph G. Morse, and Karen W. Morse. 20 Sep 75, 7p ARO-12335.6-C
Grant DAHC04-74-G-0209
Availability: Pub. in Jnl. of Fluorine Chemistry, v7 p153-158 1976.

Descriptors: *Fluorophosphines, *Photochemical reactions, Fluorinated hydrocarbons, Fluorination, Chemical bonds, Chemical analysis, Spectroscopy, Alkenes, Reprints.
Identifiers: Phosphorus fluorides.

The photoreactions of tetrafluorodiphosphine with partially fluorinated ethenes have been observed to result in the formation of 1-2-bis(difluorophosphino)-1-fluoroethane, 1-2-bis(difluorophosphino)-1-1-difluorethane, and 1-2-bis(difluorophosphino)-1-1-2-2-trifluoroethane. A rapidly diminishing yield of product results with increasing fluorination of the olefin. (Author)

PAT-APPL-678 324/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C

Thermally Stable, Highly Fused Imide Compositions.
Patent Application,
Fred E. Arnold. Filed 19 Apr 76, 13p AD-D002 621/1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Synthesis(Chemistry), *Polyimide resins, *Indoles, Heat resistant plastics, Thermal stability, Reinforcing materials, Composite materials, Protective coatings.
Identifiers: *Patent applications, PAT-CL-260-47.

This patent application covers thermally stable, highly fused imide polymers which are prepared by reacting 2,2'-bis(phenylethynyl)-4,4'-diaminobiphenyl or 2,2'-bis-(phenylethynyl)-5,5'-diaminobiphenyl with an aromatic dianhydride. The polyimides are particularly suitable for use in high temperature applications, such as in the fabrication of fiber reinforced structural composites, fibrous materials and protective coatings.

PAT-APPL-678 325/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
Phenylethynyl Substituted Aromatic Diamines.
Patent Application,
Fred E. Arnold. Filed 19 Apr 76, 15p AD-D002 622/9
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Synthesis(Chemistry), Thermal stability, Polyimide resins, Polyamide plastics, Heat resistant plastics.
Identifiers: *Patent applications, Monomers, *Benzidine/bis(phenylethynyl), PAT-CL-260-578.

As new compositions of matter, 2,2'-bis(phenylethynyl)-4,4'-diaminobiphenyl and 2,2'-bis(phenylethynyl)-5,5'-diaminobiphenyl are synthesized according to this patent application. The compounds are useful as monomers suitable for the preparation of thermally stable polymer systems such as polyimides, polyamides and poly-Schiff bases.

PAT-APPL-680 361/GA PC$3.50/MF$3.00
Department of Health, Education, and Welfare, Washington, D.C.
Intermediates for Total Steroid Synthesis from the Condensation Product of Dimethyl-3-Ketoglutarate and Glyoxal Useful as Precursors for the Total Synthesis of Steroids.
Patent Application,
Ulrich Weiss, and Kenner C. Rice. Filed 26 May 76, 23p PB-255 368/7, DHEW-E-232-75
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Synthesis(Chemistry), *Steroids, Chemical reactions, Drugs.
Identifiers: Chemical reaction mechanisms, Benz(e)indene.

This patent application relates to novel tetrahydrocyclopentano(a)naphthalene compounds as well as hexacarbomethoxy compounds which are intermediates for the total synthesis of steroids.

PATENT-3 926 808 Not available NTIS
Department of the Navy Washington D C
Fire Retardant Polyester Resins.
Patent,
Robert M. Murch. Filed 19 Jun 74, patented 18 Nov 75, 5p AD-D002 635/1, PAT-APPL-480 913
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Polyester plastics, *Fire resistant materials, Thermal stability, Additives, Laminates, Organic phosphorus compounds, Aniline, Oxychlorides.
Identifiers: PAT-CL-260-45.9, Phosphorus chloride.

The adduct from phosphorus pentachloride and aniline or allylamine when derivatized with an alcohol yields a reaction product that is useful as an additive for enhancing the fire retardant characteristics of general purpose polyester resins.

PATENT-3 926 816 Not available NTIS
Department of the Navy Washington D C
Alkoxy Derivatives of Hexachlorophosphonitrile Cyclic Trimer.
Patent,
Robert M. Murch. Filed 19 Jun 74, patented 18 Nov 75, 4p AD-D002 636/9, PAT-APPL-480 911
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Polyester plastics, *Fire resistant materials, *Phosphonitrile chlorides, Thermal stability, Organic phosphorus compounds, Chlorine compounds, Additives.
Identifiers: PAT-CL-260-75.

The patent discusses the enhancing of fire retardancy for general purpose polyester resins by admixing alkoxy derivatives of hexachlorophosphonitrile cyclic trimer with the resins before they are cured.

PATENT-3 927 033 Not available NTIS
Department of the Navy Washington D C
Lasing Dye and Method of Preparation.
Patent,
Peter R. Hammond. Filed 25 Nov 74, patented 16 Dec 75, 2p AD-D002 643/5, PAT-APPL-526 760
Supersedes AD-D000 649.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Synthesis(Chemistry), Dye lasers, Coumarins, Fluorine compounds, Oxygen heterocyclic compounds, Laser materials, Dyes.
Identifiers: PAT-CL-260-343.2, *Coumarin/hydroxy-trifluoromethyl, *Laser dyes.

4-Trifluoromethyl-7-hydroxycoumarin was prepared and disclosed as being useful as a lasing dye in the green to blue-green regions.

PATENT-3 927 147 Not available NTIS
Department of the Navy Washington D C
Haloalkoxy Derivatives of the Cyclophosphonitrilic Chloride-Hexamethylphosphoramide Adduct.
Patent,
Robert M. Murch. Filed 25 Jan 74, patented 16 Dec 75, 4p AD-D002 644/3, PAT-APPL-436 778
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Polyester plastics, *Fire resistant materials, *Phosphonitrile chlorides, Thermal stability, Organic phosphorus compounds, Chlorine compounds, Additives.
Identifiers: PAT-CL-260-927.

The adduct of a cyclophosphonitrile chloride (PNCl2)3 and hexamethylphosphoramide (Me2N)3PO when reacted with an alcohol yields a reaction product that is useful as an additive to general purpose polyester resins enchancing the resin's fire retardant characteristics.

PATENT-3 933 738 Not available NTIS
Department of the Navy Washington D C
Flame Retardant Adduct of Cyclophosphonitrilic Chloride and Hexamethylphosphoramide.
Patent,
Robert M. Murch, and Eldon E. Stahly. Filed 23 May 75, patented 20 Jan 76, 4p AD-D002 650/0, PAT-APPL-580 451
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Epoxy resins, *Fire resistant materials, Textiles, Binders, Castings, Adhesives, Thermal stability, Reinforcing materials, Crosslinking(Chemistry), Organic phosphorus compounds, Amides, Chlorine compounds, Laminates, Electrical insulation.
Identifiers: PAT-CL-260-45.9, *Phosphoryl chloride, *Phosphoric triamide/hexamethyl.

The adduct of hexamethylphosphoramide and a cyclophosphonitrilic chloride, (PNCl2)n((CH3)2N)3PO, are used for enhancing the fire retardancy of epoxy resins and a method for enhancing the fire retardancy of epoxy resins through the combination therewith.

PATENT-3 962 339 Not available NTIS
Department of Agriculture, Washington, D.C.
Process for the Production of Bicyclo Decenone Derivatives.
Patent,
Theodore J. Leitereg, Dante G. Guadagni, and Roy Teranishi. Filed 6 Apr 73, patented 8 Jun 76, 5p PB-255 622/3, PAT-APPL-348 556
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Synthesis(Chemistry), Odors, Soaps, Detergents.
Identifiers: PAT-CL-260-586, *Bicyclodecenones, Perfumes.

Limonene is epoxidized and the product reacted with BF3-etherate to produce dihydrocarvone which is condensed with 3-peten-2-one to give a mixture of the 5,6-dimethyl-9-isopropenyl and 5,10-dimethyl-7-isopropenyl derivatives of bicyclo (4,4,0) dec-1-en-3-one. The mixture is useful as an odorant to provide a woody aroma in soaps, cosmetics, toiletries, etc. Individual isomers may be separated from the mixture by such techniques as preparative glc.

PB-252 566/5GA PC$3.50/MF$3.00
Massachusetts Univ., Amherst. Dept. of Chemical Engineering.
Inactivation of Immobilized Fungal Catalase by Hydrogen Peroxide.
Robert E. Altomare, Paul F. Greenfield, and James R. Kittrell. Jun 74, 20p NSF/RA/T-74/144 Grant NSF-GI-34976

Descriptors: *Catalase, Beef, Liver, Hydrogen peroxide, Least square methods, Mathematical models, Numerical analysis.
Identifiers: *Enzyme deactivation, Enzyme engineering, Immobilized enzymes.

The deactivation of immobilized fungal catalase derived from Aspergillus by peroxide was studied in a continuous, tubular packed bed reactor. Effects of temperature peroxide concentration, and residence time were observed. Comparison with immobilized beef liver catalase showed that fungal catalase is more stable toward peroxide attack. The model of Altomare, et al, which described beef liver deactivation was applied successfully to fungal catalase deactivation. Moreover certain theoretical predictions of the model concerning the effect of space velocity were experimentally confirmed.

PB-254 498-T/GA PC$3.50/MF$3.00
Environmental Protection Agency, Research Triangle Park, N.C. Translation Services Section.
Solid Phase Disproportionation of Mercury Compounds (O Protekanii Reaktsii Diproportsionirovaniya Soedinenii Rtuti v Tverdoi Faze),
R. G. Mikaelyan, A. P. Baranov, A. K. Maltsev, and D. M. Nefedov. 1971, 5p EPA-TR-76-105
Trans. of Zhurnal Obshchei Khimii (USSR) v41 n8 p1881-1882 1971.

Descriptors: *Mercury organic compounds, *Solid phases, *Disproportionation, Translations, USSR, Solid solutions, Chemical reactions.

Disproportionation of organomercury compounds in solution is well-known and had been fully studied. The authors have discovered that similar reactions take place quite readily in solid phase--when mercury compounds are compressed with potassium bromide.

PB-254 873/3GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Group VIb Metal Carbonyl Complexes of 1,3-Dithiolene-2-Thions.
Final rept.,
Allen R. Siedle. 1975, 5p
Pub. in Inorg. Nucl. Chem. Lett., v11 n5 p345-347 1975.

Descriptors: *Metal carbonyls, *Synthesis(Chemistry), Sulfur heterocyclic compounds, Nuclear magnetic resonance, Group 7B compounds, Transition metals, Chelates, Coordination compounds, Mass spectroscopy.
Identifiers: Reprints, Chromium/(dithiole-pentacarbonyl-thio), Dithiole.

Reaction of 1,3-dithiolene-2-thione with bicyclo (2.2.1) heptadiene M(CO)4 (M = Cr, Mo) produces (1,3-dithiolene-2-thione)M(CO)5.

PB-255 193/5GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Frictional Properties of Dilute Block-Copolymer Solutions and Homopolymer Solutions. Application to Molecular Weight Determination.
Final rept.,
Francis W. Wang. 1976, 6p
Pub. in Macromolecules, v9 p97-101 Jan-Feb 76.

Descriptors: *Diffusion coefficients, *Polymers, Solutions, Numerical analysis, Molecular weight, Polystyrene, Deoxyribonucleic acids, Polymethyl methacrylate, Polyisoprene.
Identifiers: Reprints, *Block copolymers, Zimm theory.

An equation for the translational diffusion coefficient of block copolymers in dilute solution has been obtained by modifying Zimm's equation for homopolymers to take into account the existence of dissimilar segments in block copolymers. Illustrative calculations for homopolymers and block copolymers have been made and the results for homopolymers have been compared with experiments and with the calculations of Yamakawa and Fujii. A procedure has been proposed to determine the molecular weight of a block copolymer from measurements of its limiting viscosity number and its sedimentation coefficient or translational diffusion coefficient.

PB-255 679/2GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Mechanistic Studies of Phosphorus Containing Flame Retardants.
Final rept.,
C. L. McBee, and J. W. Hastie. 1976, 12p
Pub. in Proceedings of 1975 International Symposium on Flammability and Fire Retardants, Montreal, Canada, May 22-23, 1975, p253-263 (Technomic Publication Co., Inc., Westport, CT, 1976).

Descriptors: *Thermoplastic resins, *Fire resistant coatings, *Additives, *Chemical analysis, Mass spectrometry, Optical spectroscopy, Phosphorus, Vapor phase, Flammability testing, Polyester fibers, Phosphine oxide, Pyrolysis.
Identifiers: *Phosphine oxide/triphenyl.

A combination of mass spectrometric and optical spectroscopic studies has been made to establish a mechanism for phosphorus controlled flame retardancy in thermoplastics. It is shown that a vapor phase mode of flame inhibition can account for the known flame retardancy effect of triphenylphosphine oxide in polyester substrates.

7D. Physical Chemistry

AD-A027 166/8GA PC$4.00/MF$3.00
Princeton Univ N J Dept of Chemical Engineering
Pyrolysis-Molecular Weight Chromatography-Vapor-Phase Infrared Spectrophotometry: An On-Line System for Analysis of Polymers. III. Thermal Decomposition of Polysulfones and Polystyrene.
Technical rept. no. 6, Jul 75-Jul 76,
Erdogan Kiran, John K. Gillham, and Edward Gipstein. Jul 76, 31p
Contract N00014-76-C-0200
See also report dated Apr 76, AD-A023 780.

Descriptors: *Polysulfones, *Styrene plastics, *Pyrolysis, Molecular weight, Chromatographic analysis, Infrared spectroscopy, Aliphatic compounds, Polymers, Copolymers, On line systems.
Identifiers: Molecular weight chromatography, *Pyrolysis gas chromatography.

A new experimental system for investigation of the volatile products of thermal degradation has been applied to polysulfones and polystrene. (Author)

AD-A027 227/8GA PC$4.00/MF$3.00
Aerospace Corp El Segundo Calif Aerophysics Lab
Reactions of Germanium Vapor with Oxidizers: Photon Yields and a New GeO Band System.
Interim rept.,
Gene A. Capelle, and J. M. Brom, Jr. 24 Jun 76, 41p TR-0076(6751)-3, SAMSO-TR-76-132
Contract F04701-76-C-0076, Grant AF-AFOSR-2724-74
Prepared in cooperation with California Univ., Santa Barbara. Dept. of Physics.

Descriptors: Germanium, Germanium compounds, Oxides, *Chemiluminescence, *Photons, Oxidizers, Fluorides, Halides, Emission spectra.
Identifiers: Photon yield, *Germanium oxide.

Germanium was reacted with N2O, O2, NO2, and NO in a flow system, which produced GeO. Chemiluminescence was observed from three electronic band systems of GeO Vibrational constants and T sub e values have been obtained. Photon yields for each of the three GeO band systems were measured to be small (< 0.1% in all cases) and to be strongly pressure dependent in the 0.5 to 20 Torr region. Reaction of Ge vapor with F2 produced GeF chemiluminescence with a measured photon yield of .00068; the flames from Ge + Br2 and Ge + Cl2 were too weak to measure. (Author)

AD-A027 237/7GA PC$5.00/MF$3.00
Naval Postgraduate School Monterey Calif
Improvement of an Oil-Water Pollution Monitoring System.
Master's thesis,
William Ralph Gongaware. Jun 76, 98p

Descriptors: *Oil pollution, *Monitors, Sampling, Standards, Modification, Prototypes, Theses, Pumps, Substitutes.
Identifiers: Total organic carbon, *Water analysis.

A prototype of an automatic oil monitoring system was improved and used as a tool of research. The system utilizes a direct difference method of total organic carbon determination. The improvements permit a rapid evaluation of the organic carbon content of samples injected into the system to be performed. The object of the research was to determine operational standards for the type of fluids expected to transport oil into the monitoring system. (Author)

AD-A027 262/5GA PC$7.75/MF$3.00
Baird-Atomic Inc Bedford Mass Government Systems Div
A Shipboard Oil-in-Water Content Monitor Based on Oil Fluorescence.
Final rept.,
A. W. Hornig, J. T. Brownrigg, B. R. Chisholm, and L. P. Giering. Feb 76, 205p USCG-D-54-76
Contract DOT-CG-34169
See also report dated Feb 75, AD-A010 475.

Descriptors: *Oil pollution, *Monitors, *Fluorescence, Water pollution, Experimental design, Particulates, Detergents, Concentration(Composition), Infrared optical systems, Computer programs, Emission spectra, Holography, Breadboard models.
Identifiers: *Oil pollution detection, *Water analysis, Shipborne detectors, Performance evaluation, Design criteria.

A significantly improved Oil-in-Water Content Monitor has been developed and tested. A major improvement involves the use of dual polychromators to present a total luminescence image. Using a computer-designed mask, the fluorescence from various spectral regions is summed to produce approximately equal response from many oil mixtures. The monitor produces a real time output which is linear in oil concentration and which can be calibrated directly in ppm. While the fluorescence process is essentially instantaneous, (10 to the -8th sec), instrumental response is determined by the electronic time constant selected, usually 1 second. Auxiliary transmission and scatter channels permit correction of scattering from particulates. The monitor has been tested with seventeen oil mixtures from 0 to 125 ppm, showing linear response with a standard deviation of 25.9% (at 50 ppm) for all oils, and a standard deviation of 18.1% when the heaviest oil mixture F2r, is omitted. Results of the laboratory test program are fully documented, potential problems are discussed, and recommendations for further improvements are included.

AD-A027 284/1GA PC$4.00/MF$3.00
Rensselaer Polytechnic Inst Troy N Y Dept of Materials Engineering

The Adsorption and Decomposition of Ethylene on Ni(110).
Technical rept. no. 4, 1 Apr 75-30 Mar 76,
John B. Hudson, and Raymond Zuhr. 1 Apr 76, 38p
Contract N00014-75-C-0730

Descriptors: *Ethylene, *Surface chemistry, *Nickel, Adsorption, Decomposition, Auger electrons, Mass spectrometry, Chemisorption, Chemical reactions, Molecular beams, Mass spectrometry.
Identifiers: *Nickel, *Gas surface interactions.

The interaction of ethylene gas with a Ni(110) surface has been studied by a combination of modulated molecular beam mass spectrometry and Auger electron spectroscopy techniques. At temperatures below 350C, ethylene is chemisorbed with unity initial sticking coefficient up to a saturation coverage of one carbon atom per surface nickel atom. Above 150C, hydrogen evolution is observed concurrent with the adsorption process, the amount of hydrogen liberated corresponding to complete dehydrogenation of the ethylene. A physorbed ethylene species is observed to coexist with the chemisorbed layer. Above 350C formation of a graphitic surface layer is observed. The results obtained are consistent with earlier photoemission spectrometric measurements of Demuth and Eastman.

AD-A027 304/5GA PC$3.50/MF$3.00
Yale Univ New Haven Conn Dept of Engineering and Applied Science
Vibrational Excitation in Benzene by Electron Impact via Resonances: Selection Rules,
S. F. Wong, and G. J. Schulz. 28 Aug 75, 5p
ARO-11041.12-P
Grant DA-ARO-D-31-124-73-G66
Availability: Pub. in Physical Review Letters, v35 n21 p1429-1432, 24 Nov 75.

Descriptors: *Excitation, *Benzene, Electron impact spectra, Molecular vibration, Resonance, Nuclear cross sections, Electron scattering, Quantum chemistry, Reprints.
Identifiers: *Vibrational excitation, Selection rules, Electron bombardment.

The vibrational excitation in the energy ranges of the lowest resonances in benzene has been measured and it is found that only few fundamental modes become exited. This selectivity of the excitation process can be understood in terms of selection rules which are based on symmetry considerations.

AD-A027 307/8GA PC$3.50/MF$3.00
Arizona Univ Tucson Dept of Physics
Charge-state determination of Beam-Foil Spectral Lines.
Henn Oona, and William S. Bickel. 9 Sep 75, 3p
Availability: Pub. in Jnl. of the Optical Society of America, v66 n3 p278-280 Mar 76.

Descriptors: *Spectral lines, *Ion beams, *Atomic spectroscopy, *Foils(Materials), Photoelectric emission, Charged particles, Recording systems, Reprints.

Photoelectric recording of completely separated charge-state beams to give unambiguous and rigorously correct charge-state identifications is described and compared to alternative techniques. (Author)

AD-A027 317/7GA PC$3.50/MF$3.00
IBM Thomas J Watson Research Center Yorktown Heights N Y
Photoemission Energy Level Measurements of Sorbed Gases on Titanium.
D. E. Eastman. 1 Dec 71, 4p AFOSR-TR-76-0664
Contract F44620-70-C-0069
Availability: Pub. in Solid State Communications, v10 n10 p933-p935 1972.

Descriptors: *Titanium, *Photoelectric emission, *Adsorption, Energy levels, Oxygen, Carbon monoxide, Carbon dioxide, Hydrogen, Nitrogen, Reprints.
Identifiers: *Surface chemistry.

Energy distribution at hv a 21.2 eV show the energy levels and level widths of sorbed gases (h2, N2, CO, CO2 and O2) on Ti. CO and CO2 appear to dissociate into Ti/O a Ti/C upon adsorption. Exposure to .0010 Torr sec of H2 and O2 results in formation of Ti compounds on the surface. (Author)

AD-A027 318/3GA PC$3.50/MF$3.00
IBM Thomas J Watson Research Center Yorktown Heights N Y
Photoemission Studies of Energy Levels in the Palladium-Hydrogen System,
D. E. Eastman, J. K. Cashion, and A. C. Switendick. 20 May 71, 5p AFOSR-TR-76-0662
Contract F44620-70-C-0069
Availability: Pub. in Physical Review Letters, v27 n1 p35-38, 5 Jul 71.

Descriptors: *Palladium, *Hydrogen, *Photoelectric emission, *Adsorption, Energy levels, Chemical bonds, Ultraviolet spectroscopy, Reprints.

Photoemission studies of the Pd/H system show a band of hydrogen-induced energy states centered at 1 eV below the bottom of Pd-derived d bands of width 4.4 eV. These results show that the widely accepted simple 'proton model' of Pd/H is misleading. Augmented-plane-wave calculations of PdH, Pd4H3, and Pd4H exhibit these lowlying states and also explain why the added number of electrons (0.6) in Beta-phase PdH exceeds the number of d-band holes (0.36) in Pd. (Author)

AD-A027 327/8GA PC$4.50/MF$3.00
Illinois Univ At Urbana-Champaign Coordinated Science Lab
Surface Diffusion of Individual Atoms and Dimers: Re on W(211).
Technical rept.,
Kaj Stolt, William R. Graham, and Gert Ehrlich. Jun 76, 70p Rept nos. R-731, UILU-ENG-76-2219
Contract DAAB07-72-C-0259, Grant NSF-DMR72-02937

Descriptors: *Surface properties, *Diffusion, *Rhenium, Tungsten, Atoms, Dimers, Field ion microscopy, Crystal lattices.
Identifiers: Van der Waals forces.

Quantitative observations of diffusion on the W(211) have been made both for rhenium atoms and for rhenium dimers formed from atoms in adjacent (111) channels, using the field ion microscope to reveal the surface on the atomic level.

AD-A027 331/0GA PC$3.50/MF$3.00
Avco Everett Research Lab Inc Everett Mass
Halogen Negative Ion Collisional Electron Detachment Measurements,
Alexander Mandl. 1975, 13p AFOSR-TR-76-0687
Contracts F44620-70-C-0023, N00014-71-C-0388
Availability: Pub. in Modern Developments in Shock Tube Research, Proceedings of the International Shock Tube Symposium (10th) p780-787 1975.

Descriptors: Shock tubes, *Photodissociation, Collisions, Electron irradiation, Cesium, Bromine compounds, Iodine compounds, Chlorine compounds, Halogen compounds, Reprints.
Identifiers: Electron detachment, Electron collisions, Negative ions.

A series of collisional electron detachment rates has been measured for Cl(-), Br(-) and I(-). The negative ions are produced by shock heating the cesium halide salts CsCl, CsBr, and CsI, respectively. The measurements were made between 3500 K and 5500 K.

AD-A027 333/4GA PC$3.50/MF$3.00
Alabama A and M Univ Normal
Transition from Incoherence to Coherence in the Spontaneous Emission of Extended Systems,
C. T. Lee. 26 Oct 75, 6p AFOSR-TR-76-0680
Grants AF-AFOSR-2899-76, NSG-8011
Availability: Pub. in Physical Review A, v13 n4 p1657-1659 Apr 76.

Descriptors: *Quantum theory, *Atomic energy levels, *Atoms, *Photons, Emission, Operators(Mathematics), Matrices(Mathematics), Excitation, Ground state, Wavelengths, Atomic spectra, Reprints.
Identifiers: Superradiance, Spontaneous emission, Coherence.

Using the results of a previous paper, a study is presented of the evolution of a completely excited system of N two-level atoms, distributed in a circular cylinder with dimensions much larger than the wavelength, interacting with all modes of radiation field. Emphasized is the distinction between r-conserving (rC) and r-nonconserving (rNC) processes (r is the so-called cooperation number). Considering the number of photons emitted as the discrete independent variable, this evolution is described by a partial difference equation. Numerical solutions of this equation show the transition from rNC dominance at the beginning to rC dominance later. This is also a transition from incoherent to coherent emission of radiation.

AD-A027 401/9GA PC$4.00/MF$3.00
California Inst of Tech Pasadena Div of Chemistry and Chemical Engineering
Heteronuclear Dipolar Modulated Chemical Shift Spectra for Geometrical Information in Polycrystalline Solids.
Interim technical rept.,
M. E. Stoll, A. J. Vega, and R. W. Vaughan. Jul 76, 31p Rept no. TR-2
Contract N00014-75-C-0980

Descriptors: *Chemical shifts(Nuclear magnetic resonance), Polycrystalline, Benzene, Calcium compounds, Dipole moments, Crystal structure, Spin resonance, Orientation(Direction), Solid state electronics, Absorption spectra.

A double resonance multiple pulse nuclear magnetic resonance experiment is proposed and demonstrated which allows the use of heteronuclear dipolar interactions to determine geometrical, orientational, and motional information in polycrystalline solids. C13 - H1 double resonance experiments are performed in polycrystalline benzene and calcium formate to demonstrate the capabilities of the technique in its present form.

AD-A027 418/3GA PC$3.50/MF$3.00
Naval Academy Annapolis Md Energy-Environment Study Group
Studies of Detergent Systems useful in Treatment of Bilge Water and other Sewage Disposal Systems.
Final rept. 1 Jul-31 Aug 75,
Samuel P. Massie. Mar 76, 18p Rept no. USNA-EPRD-23

Descriptors: *Detergents, Bilges, *Waste water, Emulsions, Quantitative analysis, Ultraviolet Spectroscopy, Fuel oil, Lubricating oils, Cyclohexanes, Sea water.
Identifiers: *Bilge water, Spectroscopic analysis.

Ultra-violet spectroscopy has been used to study systems of a non-ionic detergent in synthetic sea water, and in cyclohexane, in concentrations of between 100 and 300 ppm, as well as mixtures of the detergent and (a) Navy Distillate Fuel Oil; (b) Turbine Extreme Pressure Lube Oil; and (c) a Light lubricating oil, in cyclohexane solution and in synthetic sea water. The detergent solutions were found to show absorbance peaks at 280 mu and 277.5 mu, to obey Beer's law, and the quantity of detergent present could be related to the absorbance at these peaks. However, in the oil/detergent mixed solutions, while the detergent showed peaks at 284 mu and 272.5 mu, and thus could be qualitatively identified, the absorbance of oil and detergent were not quantitatively additive, and thus the detergent could not be quantitatively determined in the presence of the oils. (Author)

AD-A027 458/9GA PC$4.00/MF$3.00
Air Force Environmental Technical Applications Center Scott AFB Ill
An Air Pollution Assessment of Hydrogen Fluoride,
Richard W. Fisher. Mar 76, 37p Rept no. USAFETAC-7785

Descriptors: *Hydrogen fluoride, *Air pollution, Mathematical models, Concentration(Composition), Dispersions, Diffusion, Transport properties, Wind velocity, Assessment, Aerial delivery.

The purpose of this report is to estimate the diffusion characteristics and downwind concentrations of hydrogen fluoride (HF) after it is released from an airplane. The author conducted an exhaustive search of USAFETAC's in-house technical library to determine a method or methods adaptable to this problem.

AD-A027 476/4GA PC$3.50/MF$3.00
Hawaii Univ Honolulu Dept of Physics and Astronomy
Quantitative Low-Energy X-Ray Spectroscopy (50-100-A Region),
Burton L. Henke, and Kazuo Taniguchi. 27 Aug 75, 13p AFOSR-TR-76-0612
Grant AF-AFOSR-2762-75
Availability: Pub. in Jnl. of Applied Physics, v47 n3 p1027-1037 Mar 76.

Descriptors: *X Ray spectroscopy, Emission spectra, Low energy, Solid state physics, Plasmas(Physics), Molecular orbitals, Single crystals, Excitation, Reprints.

The quantitative analysis of emission spectra in the 10-100-A region has become of considerable importance for high-temperature plasma diagnostics (region) and for molecular orbital and solid-state-band analysis. Because measurement intensities are typically low in these applications, achieving an optimum spectrographic measurement is essential. In order to present specific procedures and methods for optimizing and calibrating a low-energy spectrographic measurement, a molecular orbital analysis in the 70-90-A region has been carried out quantitatively in enrgy and intensity using a recently described single-crystal (lead stearate) spectrographic approach with about 1 eV resolution.

AD-A027 474/6GA PC$3.50/MF$3.00
Northwestern Univ Evanston Ill
Applications of the Dirac-Slater Model to Molecules,
D. E. Ellis, A. Rosen, and P. F. Walch. 4 Mar 75, 9p AFOSR-TR-76-0648
Grant AF-AFOSR-2012-71
Availability: Pub. in International Jnl. of Quantum Chemistry, Symposium, n9 p351-358 1975.

Descriptors: *Wave functions, *Energy levels, Relativity theory, Uranyl radicals, Theory, Models, Ionization potentials, Polarization, Quantum chemistry.
Identifiers: *Dirac-Slater model, Atomic number.

Applications of the Dirac-Slater model to obtain relativistic energy levels and wave functions for molecules are reported. Results are presented for the uranyl ion UO, calculated by a discrete-variational method using numerical free-atom basis functions. A simple moment polarized generalization of the Slater exchange potential is proposed for treating open-shell systems; results for a 5d atom are compared with corresponding nonrelativistic spin-polarized states. (Author)

AD-A027 480/3GA PC$3.50/MF$3.00
Florida Univ Gainesville Dept of Chemistry
ESR of the Triplet Molecules CCO and CNN in Rare-Gas Matrices; Isotope and Matrix Effects,
G. R. Smith, and W. Weltner, Jr. 23 Dec 74, 15p AFOSR-TR-76-0483
Grant AF-AFOSR-2208-72
Availability: Pub. in Jnl. of Chemical Physics, v62 n12 p4592-4604, 15 Jun 75.

Descriptors: *Electron spin resonance, *Chemical radicals, Hyperfine structure, Isotopes, Magnetic properties, Absorption spectra, Cyanides, Reprints.
Identifiers: Zero field splitting, Carbon.

No abstract available.

AD-A027 481/1GA PC$3.50/MF$3.00
Florida Univ Gainesville Quantum Theory Project
Higher-Order Decoupling of the Electron Propagator,
Lynn Tyner Redmon, George Purvis, and Yngve Ohrn. 12 May 75, 9p AFOSR-TR-76-0589
Grant AF-AFOSR-2656-74
Availability: Pub. in Jnl. of Chemical Physics, v63 n11 p5011-5017, 1 Dec 75.

Descriptors: *Ionization, Decoupling, Electron spectroscopy, Equations of motion, Reprints.
Identifiers: *Molecular energy levels, Quantum chemistry.

The decoupling of the electron propagator in the superoperator formalism is extended to include a description of processes corresponding to simultaneous electron ionization (or electron attachment) and double excitation, observed in electron spectrometry, by including products of five spin-orbital field operators in the inner projection basis. Although the terms thus introduced are fourth order in the electron interaction, an argument based on the self-consistent solution of the second-order equations suggests that these fourth-order terms are more important than the third-order terms. The argument is substantiated by numerical applications to the neon atom. A calculation using third-order shifts is compared with a calculation using the suggested fourth-order terms, but without third-order terms. (Author)

AD-A027 482/9GA PC$3.50/MF$3.00
Florida Univ Gainesville Dept of Chemistry
Evaluation of the Analytical Capabilities of Frequency Modulated Sources in multielement Non-Dispersive Flame Atomic Fluorescence Spectrometry,
T. L. Chester, and J. D. Winefordner. 4 Sep 74, 10p AFOSR-TR-76-0609
Grant AF-AFOSR-2574-74
Availability: Pub. in Spectrochimica Acta, v31B p21-29 1976.

Descriptors: *Atomic spectroscopy, *Fluorescence, Frequency modulation, Flames, Filters, Signal to noise ratio, Reprints.
Identifiers: *Atomic fluorescence spectroscopy.

Frequency modulated sources of Cd and Zn are used to produce modulated atomic fluorescence signals (at two different frequencies) in a non-dispersive flame atomic fluorescence spectrometer. To reduce the flame background level, a chlorine filter, a separated air-acetylene flame, and a solar blind photomultiplier are used. Even so, there is shown experimentally and theoretically to be a multiplex disadvantage, as compared to the conventional signal slit scanning dispersive spectrometer, as a result of the flame background photon noise and an additional multiplex disadvantage at high concentrations of an interference, e.g. in the measurement of Zn (213.9 nm), Cd (228.8 nm) results in a reduced S/N for Zn when the Cd signal level becomes comparable with the flame background signal level. Little future for multiplexed techniques in atomic flame spectrometry in the u.v. Visible is predicted. (Author)

AD-A027 505/7GA MF$3.00
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
Role of Nonequilibria in Laser Supported Combustion Waves in Nitrogen,
Doctoral thesis,
James H. Havey, Jr. Jul 76, 238p Rept no. DS/PH/76-1
Availability: Microfiche copies only.

Descriptors: *Laser target interactions, *Combustion, *Nitrogen, *Nonequilibrium flow, *Gas dynamics, Electrons, Heating, Cooling, Thermal radiation, Spectroscopy, Ionization, Transport properties, Theses, Air Force research, Chemical reactions, Hydrodynamic codes.
Identifiers: *Nonequilibria, *Laser supported combustion waves.

The role of nonequilibrium phenomena in the propagation of Laser Supported Combustion waves in nitrogen was examined from a variety of viewpoints. Graphical techniques and criteria were developed and applied over a wide range of laser power levels to assess the role and importance of possible non-Maxwellian electron energy distributions and electron thermal nonequilibrium with the heavy species for Maxwellian electron distributions. In the LSC wave power regime it was found that the electron energy distributions were essentially Maxwellian and that electron thermal nonequilibrium did not significantly affect wave propagation characteristics. Nitrogen spectroscopy was discussed, and particular features of nitrogen emission and absorption of radiation were identified as being important to radiative ionization processes and the general radiation transport problem. Chemical and ionic reactions involving atomic and molecular nitrogen and their ions were discussed, and the important reactions and their associated rates were identified. Finally, a simple, one-dimensional hydrodynamic computer code incorporating thermal radiation transport, laser absorption processes and chemical and ionic reactions was applied to two examples (at 100,000 and 1,000,000 watts/sq cm). Calculations showed that although there was substantial chemical and ionic nonequilibrium in the ionization breakdown region, these nonequilibria had a negligible effect on the propagation characteristics predicted by the equilibrium model. (Author)

AD-A027 517/2GA PC$3.50/MF$3.00
Columbia Radiation Lab New York
Radiofrequency Spectroscopy of the 5 Doublet S(1/2) State of Na 23 Hyperfine-Structure Measurement,
P. Tsekeris, K. H. Liao, and R. Gupta. 21 Jan 76, 2p
Contract DAAB07-74-C-0341

Availability: Pub. in Physical Review A, v13 n6 p2309-2310 Jun 76.

Descriptors: *Radiofrequency spectroscopy, *Hyperfine structure, *Sodium, Energy levels, Magnetic fields, Electron transitions, Resonance, Reprints.

No abstract available.

AD-A027 525/5GA PC$4.00/MF$3.00
Case Western Reserve Univ Cleveland Ohio Electrochemistry Research Lab
Mechanisms of Electrochemical Reactions on Non-Metallic Surfaces.
Technical rept.,
Ernest Yeager. 1 Feb 76, 26p Rept no. TR-44
Contract N00014-75-C-0953

Descriptors: *Surface chemistry, *Oxygen, *Semiconductor devices, *Electrodes, Electrochemistry, Chemical reactions, Fuel cells, Carbon, Graphite, Nickel compounds, Oxides, Catalysts, Electrolytes.
Identifiers: *Chemical reaction mechanisms.

Oxygen electrocatalysis has assumed new importance because of the involvement of the O2 electrode in various fuel cells and electrolyzer systems. For O2 electroreduction to proceed at reasonable current densities requires the adsorption of the O2 molecule or ion on the electrode surface. Various models for the interaction of such O2 species with surfaces and the corresponding pathways for the electro-reduction are considered. Generally peroxide mechanisms are predominant in aqueous solutions on non-metallic as well as metal surfaces but this leads to less favorable operating potentials for O2 cathodes. A number of reasonably effective O2 electroreduction catalysts have been identified for alkaline solutions but so far only high area platinum appears to combine reasonable activity and stability in acid electrolytes. Various electrocatalysts for which results have been reported in the literature are summarized. The electrochemical behavior of various carbons and graphites, lithiated NiO and various defect metal oxides including RuO2/Ti is considered in some detail relative to O2 generation as well as reduction kinetics.

AD-A027 557/8GA PC$3.50/MF$3.00
Dayton Univ Ohio Research Inst
Molecular Orbital Effects on the Ti LMV Auger Spectra of TiO and TiO2.
Technical rept. Apr-Sep 74,
J. S. Solomon, and W. L. Baun. Jun 76, 14p
AFML-TR-76-89
Contract F33615-73-C-5099

Descriptors: *Titanium oxides, *Titanium dioxide, *Auger electron spectroscopy, *Molecular orbitals, Electron transitions, Models, X ray spectroscopy.

The fine features of the Auger valence band spectra of TiO and TiO2 have been related to transitions arising from oxygen 2s and titanium 3d, 4s molecular orbitals. The N(E) valence band spectra have been unfolded and the resulting components correlated with X-ray emission data and a molecular orbital (MO) model. Differences in spectral shapes are shown to be linked with differences in the density of state of oxygen-titanium molecular orbitals.

AD-A027 579/2GA PC$6.75/MF$3.00
Rensselaer Polytechnic Inst Troy N Y
A Multichannel Real Time Mass Analyzer.
Final rept. 1 Aug 71-31 May 75,
F. A. White, T. W. Whitehead, W. A. Bryant, G. Krycuk, and J. F. Lewis. May 75, 182p AFTAC-TR-76-25
Contract F33657-72-C-0173

Descriptors: *Mass spectrometers, Ion beams, *Isotope separation, Magnetic fields, Real time, Focusing, Erbium, Uranium, Samarium, Transients, Digital computers.
Identifiers: Ion optics, Channel analyzers, Isotopic analysis.

An new advanced type of mass spectrometer has been designed and constructed which permits a real time isotopic analysis over an extended mass scale. Salient features of the device include (1) double-focusing with inhomogeneous ion optics and (2) a solid state detector system that permits hundreds of mass channels to be simultaneously monitored. This new instrumentation not only provides a vast increased sensitivity for metals analysis, but it permits the monitoring of transient and exceedingly short 'life-time' phenomena. (Author)

AD-A027 591/7GA PC$5.50/MF$3.00
Air Force Materials Lab Wright-Patterson AFB Ohio
An Investigation of Structure-Property Correlations in Polyethylene Terephthalate Films.
Final rept. Sep 74-Oct 75,
A. Viswanathan, D. R. Wiff, and W. W. Adams.
Apr 76, 120p Rept no. AFML-TR-75-207

Descriptors: *Polyethylene terephthalate, *Structural properties, *Polymeric films, X ray diffraction, Tensile properties, Mechanical properties, Orientation(Direction), Crystal structure, Computer programs.

Six characteristic types of polyethylene terephthalate (Mylar) films were studied by x-ray diffraction techniques. The degree of crystallinity, extent of preferred orientation, crystallite sizes, and paracrystalline disorder were evaluated. The tensile properties were measured in directions parallel and normal to the trace of the optic axial plane as well as in the machine and transverse directions of stretch. The influence of crystallite orientation on the mechanical properties is discussed. The exceptionally high strength in the machine direction of type 142T film may be associated with the high degree of orientation achieved by a two-way stretch followed by a post-stretch in the machine direction. The balanced, physical properties in type 1000S film are likewise attributable to the presence of two-way stretches in mutually perpendicular directions. The influence of crystallinity was masked by the anisotropic disorder arising from varying degrees of preferred orientation. The techniques employed are indicated to be applicable to other polymeric materials.

AD-A027 605/5GA PC$3.50/MF$3.00
Duke Univ Durham N C Dept of Physics
Microwave Spectrum and Substitutional Structure of CH2DF.
William W. Clark, and Frank C. De Lucia. 13 May 75, 9p ARO-11803.13-P
Contract DAAG29-74-G-0034
Availability: Pub. in Jnl. of Molecular Structure, v32 p29-36 1976.

Descriptors: *Halogenated hydrocarbons, *Microwave spectroscopy, Deuterium compounds, Molecular spectroscopy, Constants, Reprints.
Identifiers: *Methane/fluoro.

Forty-two transitions of the microwave spectrum of CH2DF have been observed in the region between 75 and 450 GHz. The measurement of both a-type and b-type transitions makes possible the analysis of the spectrum and the accurate calculation of the rotational constants (in MHz): A = 119 675.0535 + or - 0.074, beta = 24 043.4415 + or - 0.072, C = 22959.3732 + or - 072, delta J = 0.049371 + or - 0.00011, deltaJK = 0.34268 + or - 0.0006, delta K = 1.3774 + or - 0.0035, sigmaJ = 0.002329 + or - 0.000045, SigmaK = 0.0687 + or - 0.036. These constants, in combination with the results of earlier work on the symmetric species, make possible a rs structure calculation based entirely on high-o accuracy microwave data. The structural parameters are r sub ch = 1.100 A, r sub cf = 1.383 A, and HCH = 110 degrees 37'. (Author)

AD-A027 634/5GA PC$5.50/MF$3.00
Florida Univ Gainesville Engineering and Industrial Experiment Station
A Computer Program for Calculation of Potential-pH Diagrams of Metal-Ion-Water Systems.
M. H. Froning, and E. D. Verink, Jr. 1976, 103p
Contract N00014-68-A-0173-0015

Descriptors: *Electrochemistry, *pH factor, Voltage, *Computer programs, Diagrams, Metals, Ions, Water, Input, Output, Formats.
Identifiers: Pourbaix diagram.

A computer program has been developed for calculating potential-pH diagrams for Metal-Ion-Water systems. This report represents a description and documentation of the program for use by those who desire to use and further expand the program's versatility. The report includes a brief description of the program and its capabilities along with two diagrams calculated by computer, a detailed description of the procedure and format for entering data, and a description of the procedure involved in determining areas of predominance on the final diagram.

AD-A027 635/2GA PC$3.50/MF$3.00
Nucor Corp Danville N J
Shipboard Oil in Water Monitor.
Jul 74, 23p
Contract N00024-74-C-5444

Descriptors: *Monitors, *Oil pollution, *Oils, *Emission spectra, Flames, Vapor pressure, Water pollution, Sampling, Detection, Sensitivity, Performance(Engineering).
Identifiers: Flame spectroscopy, *Spectrochemical analysis, *Water pollution detection.

Laboratory studies were conducted to determine the feasibility of the flame emission technique for the monitoring of oil in water samples. The technique is useful for the detection of high vapor pressure oils; however, the lower vapor pressure materials were not detected reliably. The technique was investigated using steam stripping and vaporization to remove the oil from the sample. (Author)

AD-A027 649/3GA PC$3.50/MF$3.00
Catholic Univ of America Washington D C Dept of Chemistry
Chemical Kinetics of Some Elementary Reactions of Oxygen Atoms.
Final rept. 1 Jun 72-29 Feb 76,
Richard B. Timmons. Jun 76, 15p AFOSR-TR-76-0832
Grant AF-AFOSR-2378-72

Descriptors: *Reaction kinetics, *Oxygen, Atoms, Chemical reactions, Molecules, Electron spin resonance, Mass spectrometry, Atmospheric chemistry, Ozone.
Identifiers: Atom molecule interactions.

The research studies involved the investigation of the kinetics and mechanism of selected gas phase reactions of ground state oxygen atoms. All of the reactions studied are of either direct or indirect interest with respect to oxidative processes which occur in the atmosphere. Each reaction was studied over wide temperature ranges using fast flow apparatus coupled with electron spin resonance and/or mass spectrometric detection methods. In some

cases, (with CH3CN and CF3CN) it was necessary to use the flash photolysis-resonance fluorescence method in order to avoid the problem of free radial chain reactions observed under typical flow tube conditions. The specific rate constants obtained are expressed in terms of the usual Arrhenius equation. The specific applications of these results to environmental chemistry are discussed in this report.

AD-A027 669/1GA PC$3.50/MF$3.00
Emory Univ Atlanta Ga
Kinetics of the Reaction of Bromine Atoms with Molecular Fluorine.
Technical rept.,
Laurence W. Stratton, and Myron Kaufman. 30 Jun 76, 13p Rept no. TR-12
Contract N00014-75-C-0200

Descriptors: *Reaction kinetics, *Bromine, *Fluorine, Chemical reactions, Mass spectrometry.
Identifiers: Rate constants, Bromine atoms.

The rate constant of the reaction of bromine atoms with molecular fluorine is determined by mass spectrometrically monitoring BrF produced at fixed reaction time as a function of the concentration of F2 added to a flowing mixture of Br and Br2 in He diluent.

AD-A027 694/9GA PC$4.00/MF$3.00
Purdue Univ Lafayette Ind Dept of Chemistry
Electrode Mechanisms using Reflection and Electron Spectroscopy.
Final rept. 15 Jan 72-14 Jan 76,
Nicholas Winograd. Jun 76, 30p AFOSR-TR-76-0656
Grant AF-AFOSR-2238-72

Descriptors: *Spectroscopy, *Internal reflection, *Optical coatings, *Electrodes, Surface properties, Chemical analysis, Electron beams, *Electrochemistry, Oxides.
Identifiers: Internal reflection spectroscopy, Optically transparent electrodes, Transparent electrodes.

The general objectives of our AFOSR research have emphasized the development of various spectroscopic methods in characterizing electrochemical reactions mechanisms. The reason for exploring spectroscopic methods for investigating electrode processes stemmed from a general lack of progress from monitoring the relatively unspecific parameters of current, potential and charge. To date, these studies have involved the development of the internal reflection spectroscopic (IRS) technique at optically transparent electrodes (OTE's) to monitor in situ surface electrode reactions. Reflection changes induced both by the diffusion of light absorbing species in solution, and by the alteration of the optical constants associated with the formation of electrode films have been observed. In addition, we initiated in 1971 the first experiments utilizing electron spectroscopy for chemical analysis (XPS or ESCA) for identifying the nature of surface films. Since that time we have been concerned with developing XPS as a mechanistic aid in following electrode reactions, primarily those where surface oxide films alter the electronic properties of the electrode surface. (Author)

AD-A027 697/2GA PC$6.00/MF$3.00
California Inst of Tech Pasadena Graduate Aeronautical Labs
A Chemical Reaction in a Turbulent Jet.
Final rept.,
John R. Shea, III, and H. W. Liepmann. Apr 76, 139p AFOSR-TR-76-0806
Grant AF-AFOSR-2376-72

Descriptors: *Reaction kinetics, *Turbulent flow, Jet mixing flow, *Chemical reactions, Oxygen, Nitrogen, Axially symmetric flow.
Identifiers: Chemical kinetics, Turbulent jets.

The turbulent mixing and subsequent chemical reaction of gases is an essential part of many technological processes ranging from gas furnaces to chemical lasers. Generally the chemical kinetics are well understood, but the process of turbulent mixing is not. Knowledge of where turbulent fluid is mixed on a molecular scale is critical for predicting chemical reaction rates in the flow. In this experiment the rate of a chemical reaction in an axisymmetric turbulent jet is studied, and the results are used to determine the rate of molecular mixing in the jet. A turbulent jet containing dilute ozone in an inert mixture of nitrogen and oxygen flows into a stagnant tank of nitric oxide and nitrogen. When the gases mix on a molecular scale, the ozone and nitric oxide rapidly react to produce oxygen and nitrogen dioxide. The rate at which the mixing and chemical reaction proceeds is determined by using an ultraviolet light absorption techniques to measure the time averaged ozone concentration at points throughout the jets mixing zone. The experiment establishes a criterion for determining when a reaction of known chemical kinetics is sufficiently rapid that chemical non-equilibrium has a negligible effect on the mean reactant profile.

AD-A027 728/5GA PC$3.50/MF$3.00
Nevada Univ Reno Dept of Chemistry
Vibrational Energy Transfer in Hydrogen Molecular-Helium,
Hyung Kyu Shin. 28 Jul 75, 6p Contrib-1068, AFOSR-TR-76-0758
Grant AF-AFOSR-2231-72
Availability: Pub. in Chemical Physics Letters, v37 n1 p143-146, 1 Jan 76.

Descriptors: *Energy transfer, *Molecule molecule interactions, Vibration, Hydrogen, Helium, Temperature, Collisions, Models, Transitions, Cross sections, Reprints.
Identifiers: Landau-Teller relation.

A semiclassical approach is developed to study vibrational energy transfer in hydrogen molecule-helium by use of the a priori interaction potential including all nonzero impact parameter collisions. The calculated values of the rate coefficient are found to be in excellent agreement with experimental data which are available in the temperature ranges 60-450K and 1350-3000K. The temperature dependence is shown to seriously deviate from the Landau-Teller prediction below 1000K. The calculation was carried out over the temperature range of 30 to 10000K. (Author)

AD-A027 729/3GA PC$3.50/MF$3.00
Nevada Univ Reno Dept of Chemistry
Energy Dependence of the Cross Section for Methyl Iodide (+) Potassium yields Methyl Radical (+) Potassium Iodide Near Threshold,
Hyung Kyu Shin. 28 Oct 75, 6p Contrib-1069, AFOSR-TR-76-0757
Grant AF-AFOSR-2231-72
Availability: Pub. in Chemical Physics Letters, v38 n2 p253-256, 1 Mar 76.

Descriptors: *Energy transfer, *Molecule molecule interactions, Collisions, Models, Cross sections, Potassium, Chemical reactions, Methyl radicals, Potential energy, Reprints.
Identifiers: Methane/iodo.

The energy dependence of reaction cross sections of Methyl Iodide + Potassium yields Methyl radical + Potassium Iodide near threshold has been investigated by use of an idealized model of the hard-sphere collision of methyl iodide with potassium atom in which methyl iodide is assumed to undergo harmonic-vibrational motion. Near threshold only a small fraction of trajectories enters the reaction region, but they all pass on to reaction. As energy increases the cross section increases very sharply because more trajectories enter the reaction region. At still higher energies the cross section becomes small because a part of such trajectories reflects from the repulsive wall back to the reactant region. A maximum value of the cross section is found to be 35 angstrom-square at 3.2 kcal per mole. (Author)

AD-A027 730/1GA PC$3.50/MF$3.00
Nevada Univ Reno Dept of Chemistry
Effects of Three-Particle Collisions on Collision-Induced Light Scattering,
Hyung Kyu Shin. 2 May 75, 6p Contrib-1065, AFOSR-TR-76-0761
Grant AF-AFOSR-2231-72
Availability: Pub. in Chemical Physics Letters, v35 n2 p218-221, 1 Sep 75.

Descriptors: *Particle collisions, Light scattering, Relaxation time, Argon, Frequency shift, Collisions, Particle trajectories, Reprints.
Identifiers: Collision induced light scattering, Atom atom interactions.

A classical dynamical approach is presented to determine the effects of three-particle collisions on collision-induced light scattering. An expression for the effects is derived as a function of temperature, frequency shift, and the mean time between collisions. Application to argon shows that the effects are important over a wide range of the frequency shift when the mean time is about 0.1 picosecond and temperature is low (less than 300 degrees K).

AD-A027 732/7GA PC$3.50/MF$3.00
Florida Univ Gainesville Dept of Physics
Scattering of Low Energy He(2+) Ions by Ne, Ar, and Kr Atoms.
Technical rept.,
T. M. Austin, J. M. Mullen, and T. L. Bailey. 5 May 75, 17p Rept no. TR-10-Ser-2
Contract N00014-76-C-0127
Availability: Pub. in Chemical Physics, v10 p117-130 1975.

Descriptors: *Elastic scattering, *Helium, *Rare gases, Low energy, Neon, Argon, Charge transfer, Krypton, Interactions, Ions, Phase shift, Kinetic energy, Cross sections, Models, Reprints.
Identifiers: Atom ion interactions.

Experimental studies of collisions of He(2+) ions with Ne, Ar, and Kr atoms have been carried out at laboratory kinetic energies in the range 8 < or = E sub 1 < or = 60 eV. For each collision pair, relative differential cross sections for elastic scattering, and for the formation of He(+) by single charge transfer were measured. Information concerning the initial states of the charge transfer products were also obtained, from measurements of the kinetic energy distributions of the He(+) ions. It is likely that charge transfer in the He(2+) - Ne system proceeds via a single exothermic channel only, whereas for the other systems, transfer proceeds via a number of channels. The differential elastic scattering patterns were analyzed by means of cross section calculations based on an approximate form of the optical model.

AD-A027 733/5GA PC$3.50/MF$3.00
Florida Univ Gainesville Dept of Physics
Energetics of Charge Transfer in Collisions of Rare-Gas Ions with H2, D2, O2, N2, and NO Molecules.
Technical rept.,
T. L. Budzynski, and T. L. Bailey. 16 May 75, 24p Rept no. TR-11-Ser-2
Contract N00014-76-C-0127
Availability: Pub. in International Jnl. of Mass Spectrometry and Ion Physics, v16 p317-337 1975.

Descriptors: *Charge transfer, *Rare gases, Collisions, Hydrogen, Oxygen, Deuterium, Nitrogen, Nitrogen oxides, Energetic proper-

ties, Neon, Argon, Krypton, Mass spectrometry, Kinetic energy, Reprints.
Identifiers: Ion molecule interactions.

Investigations of simple charge transfer in collisions of Ne, Ar and Kr ions with H2, D2, O2, N2, and NO molecules have been performed in ion beam-gas target experiments at incident ion energies in the range 30-373 eV, using a variable-angle tandem mass spectrometer. Distributions in kinetic energy E3 of the product ions were measured at the observation angle 0 = 90 with respect to the incident ion direction. These E3-spectra given information concerning the internal energy changes Q of the various transfer reactions, and the internal states of the product ions. In addition, energetic product ions were observed, indicating that transfer also takes place via either strongly exothermic channels, slightly endothermic channels, or both. Dissociative charge transfer reactions in Ne-O2, Ar-D2, and Ar-H2 collisions have been studied as well, and the results and interpretations of these experiments also presented.

AD-A027 734/3GA PC$3.50/MF$3.00
Florida Univ Gainesville Dept of Physics
Thermal Broadening in Differential Ion Scattering Experiments.
Technical rept.,
T. L. Bailey, and J. M. Mullen. 21 May 75, 17p
Rept no. TR-12-Ser-2
Contract N00014-76-C-0127
Availability: Pub. in International Jnl. of Mass Spectrometry and Ion Physics, v18 p339-353 1975.

Descriptors: *Elastic scattering, *Differential cross sections, *Ions, Reprints.
Identifiers: Gas ionization, Ion beams, Cross sections, Molecular beams, Computations, Thermal broadening.

The effects of thermal broadening in differential ion scattering experiments have been investigated. Model calculations have been performed for the case of elastic scattering by a single potential, V(r), having an attractive well. These calculations show that for collision energies of several eV, and room temperature (T = 300 K) gas targets, the broadening is in some cases negligible, but in others can give serious distortion of the elastic scattering patterns. The effect is diminished, as expected, by cooling the target gas to liquid N2 temperature (T = 77.34 k). It is almost entirely eliminated in a crossed ion-neutral beams configuration. The formalism, of which the above calculations are an application, is quite general. It has been used to drive expressions for thermal broadening in measurements of product velocity distributions, and in total cross-section experiments of both the gas-scattering and crossed-beams types. (Author)

AD-A027 741/8GA PC$3.50/MF$3.00
Stanford Research Inst Menlo Park Calif Molecular Physics Center
O(Singlet S) Quenching by Ground State Oxygen Atoms,
Tom G. Slanger, and Graham Black. 10 Nov 75, 6p ARO-11553.3-C
Grant DAAG29-74-C-0003
Availability: Pub. in the Jnl. of Chemical Physics, v64 n9 p3763-3766, 1 May 76.

Descriptors: *Oxygen, *Quenching, Lasers, Atmospheric chemistry, Airglow, Ground state, Ozone, Reprints.
Identifiers: Oxygen atoms.

The quenching of O(Singlet S) by O(Triplet P) was measured as a function of temperature, between 200 K and 365 K. The resulting Arrhenius expression is k=5.0x10 to the -11th power exp(-810/RT) cc/molecule sec. The possible effect of O3 on the measurements was considered, and it is concluded that O3 does not contribute to the observed quenching. A sizable discrepancy now exists for this reaction between experiment and the most recent theoretical calculations. (Author)

AD-A027 746/7GA PC$3.50/MF$3.00
Florida Univ Gainesville Dept of Chemistry
Interference of Magnesium by Trace Concomitants in Flame Atomic Absorption Spectrometry,
C. T. Chen, and J. D. Winefordner. 12 Jul 74, 6p
AFOSR-TR-76-0765
Grant AF-AFOSR-2574-74
Availability: Pub. in Canadian Jnl. of Spectroscopy, v20 n4 p87-90 Jul-Aug 75.

Descriptors: *Atomic spectroscopy, *Trace elements, Interference, Absorption, Contaminants, *Magnesium, Aluminum compounds, Chlorides, Acetylene, Flow rate, Electric fields, Vapor pressure, Melting point, Flames, Reprints.
Identifiers: Atomic absorption spectroscopy.

The interference due to the presence of trace concomitants, generally overlooked in the previous communications, is considered in this paper. The influence of the low vapor pressure of the aqueous droplet, the high melting point of a solid particulate, and the low vapor pressure and the low surface/mass ratio of a molten droplet formed initially from a concentrated solution upon the shape of the atomic absorption analytical curve for Mg in an C2H2/Air flame is considered. The interference of various concentrations of AlCl3 upon Mg atomic absorption signals as a function of height above the burner top is also considered; it is found that at low flame heights, the plots of absorbance vs AlCl3 concentration contain fine structure (not flat curves). Finally the influence of varying acetylene flow rate and application of an electrical field across the sprayer and burner head are considered with respect to the Mg atomic absorption signals. (Author)

NTIS/PS-76/0617/1GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Chemical Analysis of Aerosols and Airborne Particulates (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Kirk G. Werner, and Diane M. Cavagnaro. Aug 76, 159p*
Supersedes NTIS/PS-75/527, and COM-74-11018.

Descriptors: *Bibliographies, *Aerosols, *Chemical analysis, Dust, Chemical composition, Abstracts, Neutron activation analysis, Spectroscopic analysis, Particles, Activation analysis, Mass spectroscopy, Chromatographic analysis.
Identifiers: *Particulates, *X ray fluorescence analysis.

Research is presented on the chemical analysis and composition of aerosols and airborne particulate matter. Techniques discussed range from chromatography to various methods of activation and spectroscopic analysis. Particle sampling techniques and particle size analysis are excluded. (This updated bibliography contains 154 abstracts, 52 of which are new entries to the previous edition.)

N76-25361/8GA PC$3.50/MF$3.00
Kanner (Leo) Associates, Redwood City, Calif.
Infrared Spectrum and Structure of NO3Cl.
K. Braendle, M. Schmeisser, and W. Luettke.
Jun 76, 16p NASA-TT-F-17085
Contract NASW-2790
Tran-Tranel. into English from Chem. Berichte (West Germany), V. 93, 1960 p 2300-2308.

Descriptors: *Infrared spectra, *Molecular structure, *Nitroxychlorides, Absorption spectra, Planar structures, Spectral bands.
Identifiers: Translations, Nitrogen chloride oxide(NClO3), West Germany.

For abstract, see STAR 1416

N76-25362/4GA PC$5.50/MF$3.00
Case Western Reserve Univ., Cleveland, Ohio. Electrochemistry Research Lab.
Electrochemical Generation of Oxygen. 1; The Effects of Anions and Cations on Hydrogen Chemisorption and Anodic Oxide Film Formation on Platinum Electrode. 2: The Effects of Anions and Cations on Oxygen Generation on Platinum Electrode.
Final Report, 1 Sep. 1972 - 31 Aug. 1975.
C. J. Huang, E. Yeager, and W. E. Ogrady. Aug 75, 124p NASA-CR-148138
Contract NGR-36-027-052

Descriptors: *Anions, *Cations, *Electrochemistry, *Electrodes, *Oxide films, *Oxygen, *Platinum, Catalytic activity, Charge transfer, Chemisorption, Electron tunneling, Film thickness, Hydrogen embrittlement.

For abstract, see STAR 1416

N76-25913/4GA PC$5.50/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Low-Energy Electron Scattering from CO. 2: Ab-Initio Study Using the Frame-Transformation Theory.
N. Chandra. Jun 76, 112p NASA-TM-X-71134, X-602-76-135
Subm-Submitted for Publication.

Descriptors: *Carbon monoxide, *Diatomic molecules, *Electron scattering, Matrices (Mathematics), Nuclear scattering, Scattering cross sections, Theoretical physics.

For abstract, see STAR 1416

PB-254 556-T/GA PC$3.50/MF$3.00
Environmental Protection Agency, Research Triangle Park, N.C. Translation Services Section.
The Rate of Crystallization of Calcium Sulfate in Sulfite Liquor in the Presence of Seeding (Skorost Kristallizatoli Sulfata Kaltsiya v Sulfitnom Shcheloke v Priautstvii Zatravki),
Yu. A. Sibirtsev, and S. A. Sapotnitskii. 1970, 7p
EPA-TR-76-115
Trans. of Gidroliznaya I Lesokhimicheskaya Promyshlennost (USSR) v23 n5 p3-4 1970.

Descriptors: *Crystallization, *Calcium sulfates, Solutions, Supersaturation, Translations, USSR.

Sulfite liquor, obtained during boiling with acid and containing not only a calcium, but also a mixed calcium-sodium base, after preliminary concentration by evaporation is a supersaturated solution of calcium sulfate. Independently of the degree of replacement of the calcium ion with a sodium ion in boiling acid during the two-step method used in industry involving the neutralization of the liquor by milk of lime and ammonia, the solubility curve of calcium sulfate passes through a minimum corresponding to a pH value of 3.5 for the liquor. Upon introduction of a seeding of gypsum crystal into the calcium sulfite liquor, the supersaturation of the solution may be decreased to a significant degree. The effect of the indicated parameters on the rate of crystallization of calcium sulfate was investigated for sulfite liquors of the Kotlassky (calcium base) and the Solikamsky (calcium-sodium base) cellulose-paper combines.

PB-254 675/9GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
The Sixth Spectrum of Uranium (U VI).
Final rept.,
Victor Kaufman, and Leon J. Radziemski, Jr. 19 Jan 76, 3p
Prepared in cooperation with Los Alamos Scientific Lab., N. Mex. Pub. in J. Opt. Soc. Am., v66 n6 p599-600 Jun 76.

Descriptors: *Uranium, *Atomic energy levels, Ionization, Excitation, Ultraviolet spectroscopy, Hartree-Fock approximation, Atomic structure.
Identifiers: Reprints, Isoelectronic sequence, Ligand fields.

Eight spectral lines of five-times ionized uranium between 800 and 1930 A are reported. Four terms (5f doublet F, 6d doublet D, 7s doublet S, and 7p doublet P) are given. Isoelectronic comparisons are made and the effect of crystal fields on the 5f electron is discussed.

PB-255 186/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Atomic Energy Levels of Rare Earth Elements.
Final rept.,
R. Zalubas, and L. Hagan. 1974, 7p
Pub. in Proceedings of Rare Earth Research Conference (11th), Traverse City, MI, October 7-10, 1974, V1 p411-416 1974.

Descriptors: *Rare earth elements, *Atomic energy levels, Spectroscopic analyses, Ions, Atoms, Gas ionization, Ionization potentials.

The report discusses briefly work done at the National Bureau of Standards by members of the Spectroscopy Section. They are investigating rare earth spectra and are working on a critical compilation of rare earth energy levels. Also a number of people in other laboratories are working on these spectra. The compilation will include all experimentally known levels of free atoms and ions of lanthanum through lutetium (Z = 57-71).

PB-255 191/9GA PC$4.00/MF$3.00
National Bureau of Standards, Washington, D.C.
The Use of X-Ray Photoelectron Spectroscopy (ESCA) for Studying Adsorbed Molecules.
Final rept.,
John T. Yates, Jr., Nils E. Erickson, S. D. Worley, and Theodore E. Madey. 1975, 32p
Pub. in The Physical Basis for Heterogeneous Catalysis, E. Draugli's and R. I. Jaffee, Eds., p75-105 (Plenum Press, New York, NY, 1975).

Descriptors: *Photoelectron spectroscopy, Formaldehyde, Chemisorption, Tungsten, Oxygen, Surfaces, Atomic energy levels, Xenon, Carbon monoxide, Adsorption.
Identifiers: *Gas surface interactions, Chemical shifts, *X ray photoelectron spectroscopy.

An ultrahigh vacuum x-ray photoelectron spectrometer has been used to study a number of cases of adsorption on tungsten single crystals. The choice of adsorbates spans a wide range from dissociative chemisorption to non-dissociative chemisorption to physisorption. A method for estimating absolute surface coverages from ESCA data has been verified by comparison with absolute molecular beam estimates of monolayer coverage for the system oxygen + W(100). The ESCA technique for measuring chemical shifts has been found to be useful in discriminating various modes of surface bonding in all adsorption systems studied. For oxygen chemisorbed on W(100), two distinct oxygen states are seen. In the case of CO chemisorbed on W(100), a direct correlation between ESCA and thermal desorption behavior has been observed for four states of chemisorbed CO. For H2CO interaction with W(100), dissociative adsorption occurs initially, followed by multilayer condensation of H2CO. For Xe physisorption on W(111), high energy sites (defects) are covered first by mobile Xe; this is followed by adsorption on the uniform surface. Coverage dependent shifts in binding energy have been observed in several cases. In all cases studied, it appears that final state extra-atomic relaxation effects dominate in determining the magnitude of the chemical shift for adsorbed species. Core-level binding energies have been found to decrease upon adsorption in all cases so far studied, and the magnitude of the decrease seems to correlate in a crude way with increasing strength of adsorption.

PB-255 194/3GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Definitive Pressure Generation in the 10-4 - 10-3 Torr Range for Atomic Scattering Experiments.
Final rept.,
B. Van Zyl, G. E. Chamberlain, G. H. Dunn, and S. Ruthberg. 10 Nov 75, 8p
Prepared in cooperation Joint Inst. for Lab. Astrophysics, Boulder, Colo. Pub. in Jnl. of Vacuum Science and Technology, v13 n3 p721-727 May-Jun 76.

Descriptors: *Pressure measurement, *Electron scattering, Temperature, Excitation, Helium, Conduction, Accuracy.
Identifiers: Reprints, Electron electron interactions.

A pressure generation technique using the dynamic expansion method is described. Measurements and uncertainties are discussed, and it is shown that the method provides a convenient means for obtaining accurate pressures in the 10 to the -3rd power to 10 to the -4th power Torr range. High confidence uncertainties as low as about plus or minus 1% are achieved.

PB-255 205/7GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Core Level Shifts in the 3d Transition Metals and Tin.
Final rept.,
R. E. Watson, M. L. Perlman, and J. F. Herbst. 17 Sep 75, 9p
Prepared in cooperation with Brookhaven National Lab., Upton, N.Y. Pub. in Physical Review B, v13 n8 p2358-2365, 15 Mar 76.

Descriptors: *Transition metals, *Tin, Atomic energy levels, Electron transitions, Band structure of solids, Atomic structure.
Identifiers: Reprints, *Chemical shifts.

The authors present estimates of various contributions to the free-atom-metal binding-energy shifts, delta E(B), for the 2s and 2p core levels of the iron series elements and, for comparison, the 3 d(5/2) level of Sn. Results indicate that the sharp break in the experimental delta E(B) values occurring between Ni and Cu is due to variation in differences of d-electron count, i.e., d configuration, between atom and metal. Lay et al. who neglected the d-configuration differences, attributed the break in delta E(B) to a change in extra-atomic screening. Through free-atom calculations extra-atomic screening energies of 6-8 eV were found for Ti through Zn with no break between Ni and Cu, and approximately 10 eV for Sn. In conjunction with charge-renormalization and dipole-term estimates, these results suggest that intra-atomic screening of core holes in metals is an important factor influencing free-atom-metal binding-energy shifts.

PB-255 212/3GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Apparent Oscillator Strengths for Molecular Oxygen, Derived from Electron Energy-Loss Measurements (Summary).
Final rept.,
R. H. Huebner, R. J. Celotta, S. R. Mielczarek, and C. E. Kuyatt. Jun 75, 3p
Sponsored in part by Argonne National Lab., Ill. Pub. in Argonne National Laboratory Report No. ANL-75-60, Part I, Radiological and Environmental Research Division Annual Report on Fundamental Molecular Physics and Chemistry, p1-2 Jul 74-Jun 75.

Descriptors: *Oxygen, Energy dissipation, Ultraviolet spectroscopy, Molecular energy levels, Excitation.
Identifiers: *Oscillator strengths.

Oscillator strengths for O2 (Figure 1) from 6 to 14 eV are derived from the energy-loss spectrum of 100 eV incident electrons. Integrated f values for the Schumann-Runge bands (Figure 2) and continuum (TABLE 1), which span four orders of magnitude in intensity, agree well with high-resolution photoabsorption measurements.

PB-255 213/1GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Apparent Oscillator Strengths for Nitrous Oxide (Summary).
Final rept.,
R. H. Huebner, R. J. Celotta, S. R. Mielczarek, and C. E. Kuyatt. Jun 75, 5p
Sponsored in part by Argonne National Lab., Ill. Pub. in Argonne National Laboratory Report No. ANL-75-60, Part I, Radiological and Environmental Research Division Annual Report on Fundamental Molecular Physics and Chemistry, p3-6 Jul 74-Jun 75.

Descriptors: *Nitrogen oxide(N2O), Energy dissipation, Ultraviolet spectroscopy, Optical measurement, Molecular energy levels, Excitation.
Identifiers: *Oscillator strengths.

Energy loss spectra of N2O were obtained in the 4 to 14 eV region and converted to oscillator strengths and compared to the optical values.

PB-255 214/9GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Ultraviolet Photoabsorption by Halocarbons 11 and 12 from Electron-Impact Measurements (Summary).
Final rept.,
R. H. Huebner, D. L. Bushnell, Jr., R. J. Celotta, S. R. Mielczarek, and C. E. Kuyatt. Jun 75, 5p
Sponsored in part by Argonne National Lab., Ill. Prepared in cooperation with Illinois Univ. at Urbana-Champaign. Dept. of Physics. Pub. in Argonne Natl. Lab. Report No. ANL-75-60, Pt-I, Radiological and Environmental Research Annual Report on Fundamental Molecular Physics and Chemistry, p18-21 Jul 74-Jun 75.

Descriptors: *Dichlorodifluoromethane, *Fluorohydrocarbons, Energy dissipation, Dissociation, Photochemical reactions, Stratosphere, Ozone, Electron irradiation.
Identifiers: Atmospheric chemistry, Methane/chloro-trifluoro, Freons, Oscillator strengths.

Electron energy loss measurements are made of Freons 11 and 12. The data is converted to oscillator strength distributions and compared to the existing photoabsorption data in the energy range relevant to atmospheric photodissociation.

PB-255 235/4GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
All-Union Symposium on High Resolution Molecular (2nd).
Final rept.,
Jon T. Hougen. Jan 75, 2p
Pub. in Appl. Opt., v14 n1 p8-9 Jan 75.

Descriptors: *Meetings, *Spectroscopy, Molecular vibration, Molecular rotation, Vibrational spectra, Rotational spectra, Instruments, Lasers, Design criteria, Performance evaluation, Line width, Line spectra.
Identifiers: Reprints, *High resolution molecular spectroscopy.

The second All-Union Soviet Symposium on High Resolution Molecular Spectroscopy was held in Novosibirsk, USSR from 11-13 September, 1974. The meetings contained some invited and many contributed papers in the fields of laser construction and application, contact-transformed vibration-rotation Hamiltonians, pressure-broadened line shapes in the one-atmosphere region, and spectroscopic instrumentation. Eighty percent of the papers were delivered in Russian, but Westerners were provided with essentially individual interpreters.

PB-255 672/9GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Resonance Lines and Energy Levels of Cs III, Ba IV, and La V.
Final rept.,
Gabriel L. Epstein, and Joseph Reader. 16 Jan 76, 10p
Prepared in cooperation with National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center. Pub. in Jnl. of the Optical Society of America, v66 n6 p590-598 Jun 76.

Descriptors: *Barium, *Cesium, *Lanthanum, *Atomic energy levels, Gas ionization, Line spectra, Excitation, Ions, Hartree-Fock approximation, Numerical analysis, Line spectra, Atomic spectra.
Identifiers: Reprints.

The spectra of Cs III, Ba IV, and La V have been observed in a sliding spark discharge on the 10.7 m normal-incidence vacuum spectrograph at NBS and the energy levels were determined. The energy parameters determined from a least-squares fit to the observed level values are compared with Hartree-Fock calculations.

PB-255 676/9GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Bis(fulvalene)diiron, its Mono- and Dications. Intramolecular Exchange Interactions in a Rigid System.
Final rept.,
Carole LeVanda, Dwaine O. Cowan, Ulrich T. Mueller-Westerhoff, George A. Candela, and R. L. Collins. 18 Aug 75, 8p
Prepared in cooperation with Johns Hopkins Univ., Baltimore, Md. Dept. of Chemistry, IBM Research Lab., San Jose, Calif., and Texas Univ. at Austin. Dept. of Physics. Pub. in Jnl. of the American Chemical Society, v98 n11 p3181-3187, 26 May 76.

Descriptors: *Iron organic compounds, *Molecular energy levels, Cations, Ferrocenes, Spectrum analysis, Excitation, X ray spectroscopy, Photoelectrons.
Identifiers: *Biferrocenes.

Biferrocenylene (bis(fulvalene)diiron, BFD) was synthesized by two independent routes: an Ullman coupling of dibromoferrocene and the reaction of the fulvalene dianion with ferrous chloride. It was chemically oxidized to the mixed valence monocation and to the dication. These derivatives were characterized by optical, Mossbauer, ESR, and x-ray photoelectron spectra and magnetic susceptibility. The Mossbauer spectra of the mixed valence salts at 298 and 77 K indicate that both iron atoms are equivalent. X-Ray photoelectron spectra similarly attest to this equivalence. An asymmetry in the intensity of the Mossbauer lines is due to a Karyagin effect. The Mossbauer spectrum of the dication shows a quadrupole splitting of 3.0 mm/s which is unusually large for a ferrocenium-type derivative. The magnetic susceptibility of BFD 2,3) picrate, measured in the 2-300 K range, follows a Curie law with a room temperature moment very close to the spin-only value. The dicationic fluoroborate salt is diamagnetic. The ESR spectra of the monocationic picrate and fluoroborate salts are characterized by narrow lines and a small rhombic anisotropy. An absorption in the near-infrared centered at 1550 nm is observed in the spectra of the monocations, but not the neutral or dicationic derivatives. The assignment of this band is discussed with respect to the results of the other physical measurements.

7E. Radio and Radiation Chemistry

PB-255 703/1GA PC$4.00/MF$3.00
Boston Univ., Mass. Dept. of Chemistry.
Photochemical Conversion of Solar Energy.
Quarterly progress rept. 1 Jan-31 Mar 76,
Norman N. Lichtin. 28 May 76, 26p
NSF/RANN/SE/AER-72-03579/A05/76/1, NSF/RA-760163
Grant NSF-AER72-03579-A05
Prepared in cooperation with Exxon Research and Engineering Co., Linden, N.J. Continuation of Grant NSF-GI-38103. See also report dated 31 Jul 75, PB-246 156.

Descriptors: *Photovoltaic cells, *Iron halides, *Iron inorganic compounds, Reducing agents, Performance evaluation, Chemical reactions, Reaction kinetics, Electrodes, Electrochemistry, Photochemical reactions, Solutions, Thionine, Dyes.

Ohmic resistance of the SnO2 electrode of the iron-thionine (TH+) TI-TL SnO2/Pt cell was shown to contribute to current losses. V(oc) of the cell varied linearly with log (white light intensity) up to at least 60 mW/sq cm while I(sc) varied linearly with light intensity up to approximately 30 mW/sq cm. Thin TiO2 layers reduced with H2 at 500C provide a promising selective anode for the iron-TH(+) cell. Cd2SnO4 deposited on quartz is a promising transparent cathode. Tuluidine blue O shows photogalvanic activity comparable to that of TH(+). Substantial sensitization to the blue of the photogalvanic activity of TH(+), methylene blue and azure A have been demonstrated for a number of dyes, of which Rhodamine 6G is the most effective sensitizer. Power output in white light has been increased by as much as 5.8 fold by sensitization. The dependence of the composition and kinetics of decay of the photostationary state of acidic iron-TH(+) solutions on solvent anions and initial concentrations of solutes has been measured and correlated with rates of elementary reactions.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

PB-255 325/3GA PC$3.50
Hawaii Univ., Honolulu. Dept. of Botany.
Ecological Components Structuring the Seaward Edges of Tropical Pacific Reefs: The Distribution, Communities and Productivity of 'Porolithon',
Mark M. Littler, and Maxwell S. Doty. 20 Jun 74, 15p UNIHI-SG-JC-75-10, NOAA-76032319
Contract AT(04-3)-235, Grant NOAA-2-35243
Prepared in cooperation with California Univ., Irvine. Dept. of Population and Environmental Biology. Pub. in Jnl. of Ecology, v63 p117-129 Mar 75.

Descriptors: *Algae, Aquatic biology, Distribution(Property), Plants(Botany), Ecology, Biological productivity, Oceans, Coastal topographic features, Plant physiology, Coral, Reefs.
Identifiers: Sea Grant program, *Porolithon, *Coral reefs, Reprints.

The paper determines quantitatively (1) the distribution and significance of Porolithon, (2) the possibility of Porolithon having a unique physiology or stress resistance in comparison to other species; and it takes a closer look at (3) the biological interactions structuring the seaward edges of reefs and, in doing so, (4) reappraises the productivity of such reef margins.

PB-255 390/7GA PC$3.50
Hawaii Inst. of Marine Biology, Honolulu.
A Quantitative Push-Net System for Transect Studies of Larval Fish and Macrozooplankton,
John M. Miller. Jan 73, 5p UNIHI-SG-JC-73-02, HIMB-Contrib-408, NOAA-76032306
Grant NOAA-2-35243
Pub. in Limnology and Oceanography, v18 n1 p175-178 Jan 73.

Descriptors: *Marine biology, *Samplers, Zooplankton, Sampling, Nets, Fishes, Shallow water.
Identifiers: Larval fish, Macrozooplankton, Sea Grant program, Push net systems.

A surface plankton sampler that quantitatively samples contiguous segments of a transect has characteristics that include operability in shallow water by two investigators, paired, self-cleaning nets, a minimum of obstructions preceding the nets, and a high ratio of filtering area to mouth area.

PB-255 417/8GA PC$3.50
Hawaii Univ., Honolulu. Dept. of Botany.
Hawaiian Marine Algae from Seaward of the Algal Ridge,
Maxwell S. Doty, William J. Gilbert, and Isabella A. Abbott. 8 Aug 74, 14p UNIHI-SG-JC-75-11, NOAA-76032318
Contract AT(04-3)-235, Grant NOAA-04-3-158-29
Prepared in cooperation with Albion Coll., Mich. Dept. of Biology and Stanford Univ., Pacific Grove, Calif. Hopkins Marine Station. Pub. in Phycologia, v13 n4 p345-357 1974.

Descriptors: *Algae, *Marine biology, Aquatic plants, Hawaii, Tables(Data), Plants(Botany), Coastal topographic features, Biogeography, Landforms, Atolls.
Identifiers: Sea Grant program, Reprints.

From fifty-four dredge hauls between the 10- and 165-m depths in Hawaii twenty-one benthic algal species, mostly minute red algae, have been added to the Hawaiian flora. While 101 species are reported, no distinctive deep water flora, zonation or dominance by one phylum was found; however, some algae do seem to be deep water species. Animal and algal communities tend to be mutually exclusive with respect to dominance. The proportion of siphonous Chlorophyta is far less than in the Caribbean or the Pacific further west, and the lack of an appropriate biological habitat appears to be a factor relating to the low number of species found and to their paucity of absolute biomass. Substratum, biogeographic factors as well as motion and fertilizer content of the water, are postulated as significant in determining what species will be found at a given deep water site or, above their compensation depth, their presence at a given depth.

PB-255 934/2GA PC$4.50/MF$3.00
Scripps Institution of Oceanography, La Jolla, Calif.
Inter-American Tropical Tuna Commission. Bibliography of El Nino and Associated Publications (Comision Interamericana del Atun Tropical. Bibliografia del Nino y Publicaciones Afines).
Bulletin,
Merritt R. Stevenson, and Helen R. Wicks. 1975. 57p NSF/IDOE-76-17
Text in English and Spanish.

Descriptors: *Marine biology, *Oceanographic data, *Bibliographies, Documentation, Fisheries, Marine meteorology, Periodicals.
Identifiers: International Decade of Ocean Exploration.

Citations from the fields of biological, physical and chemical oceanography, meteorology and marine fisheries are used to compile a new bibliography on El Nino phenomena and associated publications. An alphanumeric coding procedure relating this bibliography to a newly microfilmed version of the contents of this bibliography is described.

8B. Cartography

AD-A027 228/9GA PC$8.00/MF$3.00
Naval Environmental Prediction Research Facility Monterey Calif
Calibration, Earth Location and Mapping Programs for the NIMBUS-5 Electronically Scanning Microwave Radiometer (ESMR).
Computer programming note,
Roland Nagle. Jan 76, 131p Rept no. NEPRF-CP/Note-24

Descriptors: *Stereomapping, *Radiometers, *Image processing, Digital computers, Position finding, Sea ice, Scientific satellites, Radar mapping, Passive systems.
Identifiers: ESMR(Electronically scanning microwave radiometers), Electronically scanning microwave radiometers, Microwave radiometers, Stereographic transformation, CDC-6500 computers, NIMBUS-5 satellite.

Programs to calibrate, earth-locate, and map to polar stereographic projection the Electronically Scanning Microwave Radiometer (ESMR) data from the NIMBUS-5 satellite are presented. The NASA calibration and earth location programs are converted to the CDC-6500 computer. Full descriptions of the input data tape formats are given. Documentations of all subroutines are provided. Run instructions, control card structure and program options are also presented. Grey shade images of output on three different display devices for brightness temperature ranges selected to enhance ice/sea differences are shown. Complete program listings are provided. (Author)

E76-10389 PC$4.50/MF$3.00
Department of Scientific and Industrial Research, Lower Hutt (New Zealand). Physics and Engineering Lab.
Development of Remote Sensing Technology in New Zealand. Part 1. Mapping Land Use and Environmental Studies in New Zealand. Part 2. Indigenous Forest Assessment. Part 3. Seismotectonic, Structural, Volcanologic and Geomorphic Study of New Zealand. Part 4.
Quarterly rept. no. 2,
Marwyn C. Probine, Richard P. Suggate, Ian F. Stirling, and Michael G. McGreevy. Jun 76, 69p 531, NASA-CR-148203
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: *New Zealand, *Land use, Forests, Seismology, Tectonics, Volcanology, Geomorphology, Thematic mapping, Earth resources program.
Identifiers: *Image processing.

The author has identified the following significant results. As part of the tape reformatting process, a simple coded picture output program was developed. This represents pixel's radiance level by one of a 47 character set on a nonoverprinting line printer. It not only has aided in locating areas for the reformatting process, but has also formed the foundation for a supervised clustering package. This in turn has led to a simplistic but effective thematic mapping package.

E76-10404 PC$3.50/MF$3.00
National Research Council, Bangkok (Thailand).
Thailand National Programme of the Earth Resources Technology Satellite.
Progress rept.,
Sanga Sabhasri. May 76, 6p NASA-CR-148217

Descriptors: *Thailand, Forests, *Land use, Ground truth, Agriculture, Earth resources program, Maps, Data processing.

The author has identified the following significant results. The study on locating hill tribe villages from Landsat imagery was successful and exceeded the initial expectations. Results of the study on land use and forest mapping using Skylab data demonstrated the capability and feasibility of large scale mapping with high accuracy.

N76-25634/6GA PC$3.50/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A LANDSAT Digital Image Rectification System.
P. Vanwie, and M. Stein. May 76, 13p NASA-TM-X-71115, X-931-76-101

Descriptors: *Image intensifiers, *Multispectral band scanners, *Optical data processing, *Photomapping, Digital techniques, Landsat satellites, Photogrammetry, Remote sensors.

For abstract, see STAR 1416

8C. Dynamic Oceanography

AD-A027 423/3GA PC$5.50/MF$3.00
Texas A and M Univ College Station Dept of Oceanography
Response of a Two-Layer Ocean with a Baroclinic Current to a Moving Storm. Part III. Barotropic and Baroclinic Modes.
Technical rept.,
Takashi Ichiye, and Michael Carnes. May 76, 113p Rept no. TAMU-Ref-76-3-T
Contract N00014-75-C-0537, Grant NSF-OCE-70-00312

Descriptors: *Ocean currents, *Air water interactions, *Ocean models, Stratification, Wind, Typhoons, Equations of motion, Interfaces, Perturbations, Response, Pacific Ocean, Mathematical models, Upwelling, Storms, Ocean surface, Transport properties, Iterations, Approximation(Mathematics), Layers, Computer graphics.
Identifiers: Western boundary currents, Barotropic models, Baroclinic transport, Geostrophic currents, Wind stress, Kuroshio Current, Baroclinic layers.

The normal mode equations for a two-layer ocean without current are scaled with characteristic distance, wind stress and time (or moving speed). When there is a geostrophic current in the upper layer, the normal mode separation is not possible, but equations for the barotropic transports include effects of the stationary current forcing terms as perturbation terms and the storm induced baroclinic transports as forcing functions. For a typical typhoon moving over the Kuroshio, the effects of the currents and the baroclinic transport become negligible for the barotropic transports which are determined by an iteration method. When the moving speed is less or more than about 5 m/sec, slow-moving or fast-moving approximation can be used. In the 1st case the interface shows almost uniform upwelling in a wake of the storm, and this is intensified slightly by the barotropic transports, particularly when the storm moves over the maximum current axis. In the 2nd case the interface shows undulated upwelling and effects of the barotropic transports become less than in the 1st case.

AD-A027 467/0GA PC$5.00/MF$3.00
Hydronautics Inc Laurel Md
A Laboratory Study of Wind-Wave-Current Interaction. Part II.
Technical rept.,
Richard S. Scotti, Garry W. Elliott, and Mark S. Rice. Jun 76, 90p Rept no. TR-7619-1
Contract N00014-76-C-0593, ARPA Order-1910
See also report dated Jan 75, AD-A024 002.

Descriptors: *Air water interactions, Water waves, Wind velocity, Profiles, Currents, Mathematical models.

This report studies the effect of wind and a spatially varying subsurface current field on both the wind-induced drift layer and the surface-wave spectrum. Steady state wind-wave-current interactions were established over a region of uniform current gradients which simulated an internal-wave-fixed measuring system. Wave-height spectra were recorded while wave-slope spectra were simultaneously made.

AD-A027 731/9GA PC$3.50/MF$3.00
Louisiana State Univ Baton Rouge Coastal Studies Inst
Circulation Observations in the Louisiana Bight using Landsat Imagery.
Technical rept.,
Lawrence J. Rouse, and James M. Coleman. 1 Dec 75, 15p Rept no. TR-215
Contract N00014-75-C-0192
Availability: Pub. in Remote Sensing of Environment, v5 P55-66 1976.

Descriptors: *Bays, Louisiana, Scientific satellites, Aerial photographs, Wind velocity, Sediments, Turbidity, Reprints.
Identifiers: *Louisiana Bight, Remote sensing.

A method for quantifying the turbidity of offshore water masses using LANDSAT imagery is discussed and the results of a laboratory experiment correlating radiance with concentrations of suspended Mississippi River sediment are presented. The results of the experiment are used to plot suspended sediment contours on eight LANDSAT images of the Louisiana Bight. These contours are observed to depend on the speed and direction of the wind as well as the amount of fresh water discharged by the Mississippi River. The presence of a clockwise circulation in the bight is also indicated by the contours. (Author)

NTIS/PS-76/0629/6GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
The Gulf Stream (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Audrey S. Hundemann. Aug 76, 130p*
Supersedes NTIS/PS-75/525.

Descriptors: *Bibliographies, *Gulf Stream, Sea water, Ocean currents, Salinity, Temperature, Transport properties, Remote sensing.

Abstracts dealing primarily with the Gulf Stream's currents, salinity, temperature and transport properties are presented. A few abstracts pertain to oceanographic equipment used in the studies. Remote sensing studies are included. (This updated bibliography contains 125 abstracts, 15 of which are new entries to the previous edition.)

N76-25743/5GA PC$5.50/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Tidal Parameters Derived from the Perturbations in the Orbital Inclinations of the Be-C, Geos-1 and Geos-2 Satellites.
D. P. Rubincam. Apr 76, 105p NASA-TM-X-71118, X-921-76-72

Descriptors: *Geos 1 satellite, *Geos 2 satellite, *Satellite perturbation, *Tides, Amplitudes, Applications of mathematics, Earth (Planet), Energy dissipation, Love waves, Ocean surface, Phases.

For abstract, see STAR 1416

PATENT-3 929 015 Not available NTIS
Department of the Navy Washington D C
Line Motion and Water Current Disc Sensor.
Patent,
Michael L. Greene, and George J. Moss. Filed 30 Apr 75, patented 30 Dec 75, 4p AD-D002 646/8, PAT-APPL-573 278
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Ocean currents, *Oceanographic equipment, *Measuring instruments, *Patents, Velocity, Mooring, Motion.
Identifiers: PAT-CL-73-170.

The patent describes an instrument for determining velocity of ocean currents and/or frequency and amplitude of strumming mooring lines. A magnetic controlled contact relative to resistance wires controlled by a spring loaded disc operates as a potentiometer to indicate the intended result.

PB-255 515/9GA Not available NTIS
Woods Hole Oceanographic Institution, Mass.
Statistical Observations of the Trajectories of Neutrally Buoyant Floats in the North Atlantic,
H. J. Freeland, P. B. Rhines, and T. Rossby. 1 Jul 75, 25p NSF/IDOE-76-46
Pub. in Jnl. of Marine Research, v33 n3 p383-404 Sep 75.

Descriptors: *Ocean currents, *Floats, *Drift(Instrumentation), Statistical analysis, Velocity measurement, Water flow, Circulation, North Atlantic Ocean, Sofar.
Identifiers: Reprints, International Decade of Ocean Exploration.

The report describes the statistical behavior of neutrally buoyant SOFAR floats, drifting at 1500 mm depth in the Sargasso Sea where the currents are dominantly time-dependent. The float level is fairly typical of the deep ocean below the main thermocline. The purpose of this report is to present the results of a more detailed examination of the float trajectories, including some statistical observations and dynamic inferences.

PB-256 653/8GA PC$5.00/MF$3.00
Hawaii Inst. of Geophysics, Honolulu.
The Role of Vertical Motion in the Heat Budget of the Upper Ocean.
Doctoral thesis,
William Jackson Emery. Aug 75, 89p HIG-75-3, NSF/IDOE-76-53
Contract N00014-67-A-0387-0017, Grant NSF-IDO74-24583

Descriptors: *Ocean temperature, *Temperature gradients, *Thermoclines, *Heat budget, Bathythermograph data, Bathermographs, Bathymetry, Isotherms, Oceanographic data, North Pacific Ocean, Theses.
Identifiers: International Decade of Ocean Exploration.

The heat budget of the upper ocean was studied to determine the importance of including heat changes due to vertical motion and divergence. Bathythermograph observations in the eastern Pacific were used to form time series of monthly average thermal structure at ocean weather station November and various 5 degree and 2 degree squares between California and Hawaii. A heat budget equation is derived that includes a term to account for heat changes due to vertical motion and hence divergence.

PB-255 733/8GA Not available NTIS
Connecticut Univ., Groton.
Ocean Interiors and Coastal Upwelling Models,
Richard W. Garvine. 4 Jun 73, 6p NSF/IDOE-76-28
Grant NSF-GX-33502
Pub. in Jnl. of Physical Oceanography, v4 n1 p121-125 Jan 74.

Descriptors: *Oceans, *Coastal regions, *Upwelling, Ocean bottom topography, Ocean currents, Wind(Meteorology).
Identifiers: Reprints, International Decade of Ocean Exploration.

The constraints imposed upon a coastal upwelling zone by the steady-state wind-driven dynamics of the interior of an ocean basin are examined. A parameter is found which measures the strength of the bottom boundary layer in the interior. Oceanic conditions correspond to small values of this parameter and, thus, the bottom boundary layer is weak. For these conditions the meridional mass flux can be prescribed at the boundary of the interior in terms of local variables. The zonal mass flux is developed for a meridional eastern boundary. A mean meridional pressure gradient is shown to be impressed on the eastern boundary upwelling region by the interior dynamics.

8D. Geochemistry

PB-254 584-T/GA PC$3.50/MF$3.00
Environmental Protection Agency, Research Triangle Park, N.C. Translation Services Section.
Lithium and Thorium Content in Yellow Podzolic Soils (Soderzhanie Litiya I Toriya v Zheltozemno-Podzolistykh Pochvakh),
A. I. Baeva. 1970, 9p EPA-TR-76-133
Trans. of Akademiya Nauk Azerbaidzhanskoi SSR, Baku. Izvestiya. Seriya Biologicheskikh Nauk, n5-6 p69-71 1970.

Descriptors: *Lithium, *Thorium, *Soil chemistry, Colorimetry, Trace elements, Translations, USSR.
Identifiers: *Podzolic soils.

Study of the content of trace elements in yellow soils has definite scientific interest. This interest stems from the peculiarities of the genetic development of these particular soils. This paper examines the lithium and thorium content, as well as questions concerned with the distribution of these elements through the soil profile, using as the example yellow podzolic soils with different degrees of podzolization. Colorimetry was used to determine the lithium and thorium.

PB-254 587-T/GA PC$3.50/MF$3.00
Environmental Protection Agency, Research Triangle Park, N.C. Translation Services Section.
The Bulk Content of Uranium, Radium, and Thorium in Certain Soil-Forming Rocks,
D. M. Rubtsov, and T. V. Gil. 1972, 14p EPA-TR-76-136
Trans. of mono. Valovoe Sodevzhanie Urana, Radiya i Toriya v Nekotorykh Pochvoobrazuyushchikh Porodakh, Syktyvkar, 1972.

Descriptors: *Radioactivity, *Rocks, *Soil chemistry, *Uranium, *Radium, *Thorium, Trace elements, Translations, USSR.

No abstract available.

8E. Geodesy

AD-A027 490/2GA PC$3.50/MF$3.00
Air Force Geophysics Lab Hanscom AFB Mass
New Test of Equivalence Principle from Lunar Laser Ranging,
J. G. Williams, R. H. Dicke, P. L. Bender, C. O. Alley, and W. E. Carter. 8 Dec 75, 5p Rept no. AFGL-TR-76-0155
Availability: Pub. in Physical Review Letters, v36 n11 p551-554, 15 Mar 76.

Descriptors: *Gravitational fields, *Earth(Planet), *Moon, Mass energy relation, Range(Distance), Range finding, Optical radar, Relativity theory, Reprints.
Identifiers: *Equivalence principle, *Nordtvedt effect, Laser range finding.

An analysis of six years of lunar laser ranging data gives a zero amplitude for the Nordtvedt term in the Earth-Moon distance yielding the Nordtvedt parameter ETA = 0.00 + or - 0.03. THus, Earth's gravitational self-energy contributes equally, + or - 3%, to its inertial mass and passive gravitational mass. At the 70% confidence level this result is only consistent with the Brans-Dicke theory for Omega > 29. The absolute value beta - 1 approx < 0.02 to 0.05 is obtained for five-parameter parametrized post-Newtonian theories of gravitation with energy-momentum conservation, or absolute value beta if only beta and gamma are considered.

8F. Geography

AD-A027 468/8GA PC$3.50/MF$3.00
Environmental Research Inst of Michigan Ann Arbor
Basic Investigations for Remote Sensing of Coastal Areas.
Quarterly rept. 1 Apr-15 Jul 76,
R. A. Shuchman, F. J. Thomson, and D. R. Lyzenga. 15 Jul 76, 25p Rept no. ERIM-108900-7-L
Contract N00014-74-C-0273
See also report dated 15 Oct 75, AD-A019 959.

Descriptors: *Coastal regions, Radar mapping, Beaches, Shallow water, Reflectance, Grain size, Backscattering, Ocean bottom topography, Terrain analysis radar, Multiband spectral reconnaissance, Sand, Rock, Mathematical models.
Identifiers: *Remote sensing.

During the recording period four activities took place. The second year interim report was extensively revised using comments from the sponsor and ERIM personnel and currently is in printing. A detailed program plan for 1974 ONR activities was written and distributed internally to key ERIM personnel for review. Work has commenced on obtaining critical optical properties of beach minerals needed as inputs into the Beach Environment model. And in the water modeling area, work is progressing along two fronts: (1) a computer program has been writ-

ten to implement a combined water-atmosphere model, and (2) further theoretical work has indicated a small correction to be made to the existing QSS model.

E76-10406 PC$3.50/MF$3.00
Texas A and M Univ., College Station. Remote Sensing Center.
Applied Regional Monitoring of the Vernal Advancement and Retrogradation (Green Wave Effect) of Natural Vegetation in the Great Plains Corridor.
Progress rept. Feb-Apr 76,
John W. Rouse, Jr. May 76, 22p RSC-3018-5, NASA-CR-148219
Contract NAS5-20796

Descriptors: *Vegetation, *Oklahoma, *Texas, Drought, Great Plains Corridor(North America), Earth resources program, Maps, Green wave effect.
Identifiers: Great Plains Region(United States).

The author has identified the following significant results: A TVI6 isoline map at the 6.25 million hectare extended test site area in north central Texas and southern Oklahoma was produced. The map was compared to a published USDA Statistical Reporting Service map, which shows pasture and range feed conditions, as reported by rancher respondents. Both maps show similar areas of drought stress and good to excellent forage conditions, but preliminary indications are that the Landsat-derived map more accurately depicts the areal extent of each condition class.

PB-255 318/8GA PC$5.00/MF$5.00
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
LANDSAT 1. Cumulative Non-U.S. Standard Catalog, 1974/1975. Observation ID Listing, Coordinate Listing.
Annual rept. 23 Jul 74-23 Jul 75.
23 Jul 75, 568p GSFC/NI/1-75/1
See also PB-251 424, PB-251 425, PB-251 426, and PB-251 427.

Descriptors: *Natural resources, *Remote sensing, *Indexes(Documentation), Spaceborne photography, Foreign countries, Cloud cover, Earth orbits, Sun, Elevation, Azimuth, Scientific satellites, Tables(Data), Data storage, Coordinates.
Identifiers: LANDSAT satellites, LANDSAT 1 satellite, LANDSAT 2 satellite, ERTS satellites, Image processing.

The Landsat 1 Cumulative Non-US Standard Catalog 1974/1975 lists Non-US imagery acquired by Landsat 1 during the year from July 23, 1974 through July 23, 1975. Data, such as date acquired, cloud cover and image quality are given for each scene. The microfilm roll and frame on which the scene may be found is also given.

8G. Geology and Mineralogy

AD-A027 305/2GA PC$3.50/MF$3.00
Utah Univ Salt Lake City Dept of Geological and Geophysical Sciences
Crustal Structure Across the Wasatch Front from Detailed Seismic Refraction Studies,
L. W. Braile, R. B. Smith, G. R. Keller, R. M. Welch, and R. P. Meyer. 12 Jul 73, 10p
Contract N00014-67-A-0325-0004
Availability: Pub. in Jnl. of Geophysical Research, v79 n17 p2669-2677, 10 Jun 74.

Descriptors: *Earth crust, *Structural geology, Utah, Wyoming, Seismic waves, Thickness, Reprints.
Identifiers: *Wasatch, Mountains, Seismic refraction.

A high-resolution seismic refraction profile using large open-pit mine blasts as sources has been recorded along a 340-km profile that crosses the Basin and Range-Middle Rocky Mountains province boundary in northern Utah. Interpretation of these data and existing U.S. Geological Survey Refraction lines indicate a crustal thickness of 28 km and an upper mantle P wave velocity of 7.6 km/s in the eastern Basin and Range, increasing to 40 km and 8.0 km/s, respectively, in the Middle Rocky Mountains. The increase in crustal thickness does not occur at the boundary between physiographic provinces but begins about 40 km east of the Wasatch front. The zone of increase of crustal thickness, beginning east of the Wasatch front, correlates with the eastern limit of late Cenozoic block faulting, a zone of shallow seismicity, the boundary between high and normal heat flow, and an upper mantle conductivity anomaly. A crustal low-velocity layer located between 10 and 15 km in depth is suggested to be continuous from the Basin and Range province into the Middle Rocky Mountains province. Existing data are insufficient to indicate the possible eastern limit of the crustal low-velocity layer. Shear wave velocities for intermediate crustal depths, including the low-velocity layer, are anomalously low. Poisson ratios for the low-velocity layer as high as 0.32 may be interpreted. These ratios suggest that the low-velocity layer is a zone of low rigidity.

AD-A027 309/4GA PC$4.00/MF$3.00
Utah Univ Salt Lake City Dept of Geological and Geophysical Sciences
Guide to the Interpretation of Crustal Refraction Profiles,
Lawrence W. Braile, and Robert B. Smith. 25 Oct 74, 32p
Contract N00014-67-A-0325-0004
Availability: Pub. in Geophysical Jnl. of the Royal Astronomical Society, v40 p145-176.

Descriptors: *Earth crust, *Structural geology, Seismic reflection, Refraction, Velocity, Arrival, Time studies, Seismic waves, Reprints.

Using the reflectivity method, synthetic, vertical-component seismograms have been computed for simple velocity transitions appropriate to crustal models. Record sections of the synthetic seismograms including refracted and reflected phases aid in elucidating the fine structure of the crust since they illustrate the effects of various velocity models. The computed record sections indicate the importance to interpretation of secondary arrivals such as near-vertical incidence and wide-angle reflections and illustrate the following: (1) an upper crustal low velocity layer (LVL) can best be recognized from reflections from the top of the LVL; (2) wide-angle reflections are nearly always of larger amplitude than head waves and have apparent velocities indicative of the layer velocities; (3) head wave amplitudes are greatly affected by velocity gradients within the refracting layer; (4) near-vertical incidence reflections are of significant amplitude principally for reflections from first-order velocity discontinuities; and (5) complex wave patterns result from relatively simple upper crustal models which contain an LVL and serve to emphasize the need for detailed amplitude studies so that amplitudes of head waves and near-critical reflections may be considered. Synthetic seismograms which closely approximate observed seismograms for a detailed refraction line in the eastern Basin and Range province are used to infer fine structure of the crust. Synthetic record sections computed for a Basin and Range and an eastern United States crustal model illustrate different amplitude-time-distance features which are characteristics of observed seismic data from these regions. (Author)

AD-A027 310/2GA PC$3.50/MF$3.00
Utah Univ Salt Lake City
Fine Structure of the Crust Inferred from Linear Inversion of Rayleigh-Wave Dispersion,
L. W. Braile, and G. R. Keller. 21 Jun 74, 13p
Contract N00014-67-A-0325-0004
Availability: Pub. in Bulletin of the Seismological Society of America, v65 n1 p71-83 Feb 75.

Descriptors: *Earth crust, *Seismic waves, *Earth models, Wave propagation, Rayleigh waves, Surface waves, Dispersing, Inversion, Seismic data, Shear properties, Velocity, Spatial distribution, Layers, Reprints.

The Backus-Gilbert inversion formulation applied to surface-wave dispersion measurements can be used to infer detailed shear-velocity distribution in the Earth's crust. In this study, Rayleigh-wave group-velocity dispersion measurements were used to derive the shear-wave velocity distribution within a crustal model consisting of 15 to 20 layers whose thicknesses were held fixed. Simultaneous inversion of fundamental model (4- to 36-sec period) and first higher-mode (3- to 6-sec period) data was sufficient to obtain crustal models displaying high resolution. In order to avoid the ambiguity associated with large side lobes in the resolving kernels, the inversion scheme was modified to yield smooth resolving kernels. This improvement was particularly important to the problem of recognition of a crustal low-velocity layer. It is suggested that, by using Rayleigh-wave group-velocity measurements with standard deviations of 0.03 km/sec, crustal shear-velocity models may be derived which have estimated standard deviations of 0.15 km/sec and resolving kernels with spreads of less than 7 km.

AD-A027 424/1GA PC$5.50/MF$3.00
Army Engineer Nuclear Cratering Group Livermore Calif
Summary of Geology and Rock Physical Properties Route 17.
23 Sep 69, 118p Rept nos. NCG-31, NCG-203-17

Descriptors: *Geology, Igneous rock, Sedimentary rock, *Panama, Canals, Routing, Excavation, Nuclear explosions, Topography, Structural geology, Engineering geology, Mountains, Rock mechanics, Soils, Weathering, Ground water, Maps.
Identifiers: Panama Canal.

This report of the Atlantic-Pacific Interoceanic Canal Study Commission describes Eastern Panama as a former vocanic area, still subject to earthquakes. The region comprises 3 major physiographic provinces: the Pacific highlands, the Central lowlands, and the highlands of the Continental Divide. The rocks are igneous, pyroclastic, and sedimentary, and the geologic structure varies from complex to simple in different areas. The residual clayey and silty soils of the area, produced by tropical weathering, are generally less than 20 feet thick. Beneath them lies a variable mantle of weathered rock. The annual wet and dry season cause a notable fluctuation in the ground water table. The rocks range considerably in strength, and include the following types: Strong basalts, tuffs, agglomerates, and tuffaceous limestones; medium-strength tuffs, agglomerates, and tuffaceous limestones; and weak calcareous and non-calcareous tuffs, tuffaceous siltstones and sandstones, shaly limestones, and shales. The strength of the rocks correlates well with the topography they support.

AD-A027 425/8GA PC$5.00/MF$3.00
Army Engineer Nuclear Cratering Group Livermore Calif
Summary of Geology and Rock Physical Properties Route 25.
20 Oct 69, 81p Rept nos. NCG-33, NCG-203-25

Descriptors: *Geology, Igneous rock, Sedimentary rock, Faults(Geology), *Panama, Canals, Routing, Excavation, Nuclear explosions, Topography, Structural geology, Engineering geology, Rock mechanics, Sediments, Mountains.
Identifiers: Panama Canal.

This summary, for the Atlantic-Pacific Interoceanic Canal Study Commission, deals principally with the Pacific portion of Route 25, where nuclear excavation may be applicable. Physiographically Route 25 is composed of the small and discontinuous Pacific strand, the Choco and Saltos highlands, and the Atrato lowland, which continues from the Saltos highlands to the Gulf of Uraba. Near the Upper Truando Valley, the route crosses about two miles of sedimentary rocks of the Sautata and Nercua groups, Which, since they support rugged topography and are firm in outcrops, are believed to be competent. The structural geology of the area is characterized by abundant faulting. Although no complete picture of the regional geology has been developed, the main structural elements of the area are the Serrania de Baudo, the Bolivar geosyncline, and the Cordillera Occidental and its structural continuations, the buried Sautata Arch and the Serrania del Darien.

AD-A027 842/8GA PC$5.50/MF$3.00
Hawaii Inst of Geophysics Honolulu
Sedimentary Processes and Pelagic Turbidites in the Eastern Central Pacific Basin.
Master's thesis,
Patrick H. Lineberger. 1 Dec 75, 122p Rept no. HIG-75-24
Contract N00014-70-A-0016-0001

Descriptors: *Ocean bottom sampling, *Pacific Ocean, *Sediments, Seismic reflection, Calcite, Theses, Cores.
Identifiers: Oozes, Pelagic zone.

Analysis of sediment cores from an area of the eastern Central Pacific basin revealed varied characteristics of the cores and associated acoustical properties of the sediments that enabled the study area to be divided into five provinces. Two of the provinces, one consisting of acoustically highly transparent siliceous ooze and the other of highly stratified calcareous ooze, are separated by a third, a siliceous-calcareous transition zone. A fourth province consists of partially eroded, highly stratified sediments of Tertiary age which are unconformably overlain by a thin, transparent siliceous ooze of Quaternary age. The fifth province consists of channels arranged in a distributary-like pattern that contain highly stratified sediments incised into surrounding transparent siliceous sediments. Surface sediment distribution was generally consistent with the calcite compensation depth of about 5000 meters.

AD-A027 738/4GA PC$3.50/MF$3.00
Scripps Institution of Oceanography San Diego Calif Marine Physical Lab
Erosion on the Line Islands Archipelagic Apron: Effect of Small-Scale Topographic Relief.
Summary rept.,
William R. Normark, and Fred N. Spiess. 5 Aug 74, 15p Rept no. MPL-U-59/73
Contract N00014-69-A-0200-6002, Grant NSF-GA-31377
Availability: Pub. in Geological Society of AMerica Bulletin, v87 p286-296 Feb 76.

Descriptors: *Marine geology, *Pacific Ocean Islands, Hawaii, Erosion, Sedimentation, Ocean Bottom, Echo ranging, Reprints.
Identifiers: Line Islands, Ocean bottom topography.

A small area (10 x 16 km) on the northeast flank of the Line Islands archipelagic apron was studied in detail, using a deep-towed geophysical instrumentation system. Along the southern edge of the area, a moat several kilometers wide and 30 m deep lies at the base of an east-trending seamount cresting 1,500 m above the sediment apron. Both surface-ship 3.5-kHz and deep tow 4-kHz reflection profiles show that much of the relief of this moat is the result of slower deposition of sediment (or the lack of deposition) in the upper part of the sediment apron. In marked contrast, another moat in the northern portion of the area has been eroded 90 m below the smooth surface of the surrounding apron. This irregularly shaped moat is more than 7 km in length, although the adjacent seapeak (175 m high) is only 1 km in diameters. The sediments on the floor itself are suggestive of a coarse lag deposit. Short-term (up to 9 days) current-meter records showed that the prevalent current was about 2 to 3 cm/sec from the northeast, with small tidal perturbations. The morphology of this deep, irregular feature suggests that it may have formed during episodes of intensified bottom-water flow from the west-northwest, possibly as Pacific bottom water intermittently flowed through the area during the glacial intervals of the Pleistocene period.

AD-A027 743/4GA PC$4.00/MF$3.00
Lamont-Doherty Geological Observatory Palisades N Y
Late Cenozoic Planktonic Foraminiferal Biostratigraphy of Northwest Pacific Sedimentary Sequences,
Seijuro Maiya, Isunemasa Saito, and Tomindo Sato. 1976, 31p Rept no. LDGO-2230
Contract N00014-67-A-0108-0004, Grant NSF-DES-72-01571
Availability: Pub. in Progress in Micropaleontology, p395-422 1976.

Descriptors: *Foraminifera, *Micropaleontology, Zooplankton, Evolution(Biology), Stratigraphy, Geologic age determination, *North Pacific Ocean, Deep oceans, Japan Sea, Sea water, Temperature, Indicators, Reprints.
Identifiers: Paleomagnetism, Paleoclimatology, Petroleum geology.

A combined planktonic foraminiferal and paleomagnetic stratigraphy extending back to about 1.8 million years B.P. in northwest Pacific deep-sea cores is compared with foraminiferal biostratigraphy of Late Cenozoic sediments in oil-producing region of Japan. Species belonging to two rapidly evolving lineages of planktonic foraminifera and systematic changes in the coiling direction of Globigerina pachyderma provide datum levels for stratigraphic correlation. Since the sinistral population of G. pachyderma are known to occur in high northern latitudes, the sudden appearance of the sinistrally coiled G. pachyderma at about 1.2m.y. B. P. indicates considerable temperature decline in the North Pacific, possibly coincident with the initiation of mid-latitude glaciations of Europe and North America. Eustatic lowering of sea level exposed the shallow Korea Strait as a land bridge, terminating the flow of warm Pacific waters into the Sea of Japan. The curtailment substantially lowered water temperatures of the Sea of Japan, bringing the left-coiling populations of G. pachyderma into areas formerly inhabited by the right-coiling populations.

E76-10380 PC$3.50/MF$3.00
Helsinki Univ. (Finland). Dept. of Geology.
Investigation of LANDSAT Imagery on Correlations Between Ore Deposits and Major Shield Structures in Finland.
Quarterly progress rept. no. 3, Jan-Mar 76,
Keikki V. Tuominen. Mar 76, 13p NASA-CR-148204
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Minerals, *Finland, Structural properties(Geology), Winter, Geomorphology, Baltic Shield(Europe), Earth resources program, Photointerpretation, Pattern recognition, Maps.
Identifiers: *Mineral deposits, Image processing.

The author has identified the following significant results. Half of the 24 lineaments found in the Landsat winter mosaic have not been recorded in earlier literature. Some distinct fracture zones of the basement seem not to be observable as lineaments in the Landsat imagery.

PATENT-3 961 524 Not available NTIS
Department of the Interior, Washington, D.C.
Method and Apparatus for Determining Rock Stress in situ.
Patent,
Rodolfo V. de la Cruz. Filed 6 May 75, patented 8 Jun 76, 13p* PB-255 368/3, PAT-APPL-574 992
Supersedes PB-244 191.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Rock mechanics, *Rock tests, *Patents, Stresses, Field tests, Rock properties, Boreholes, Jacks(Lifts).
Identifiers: PAT-CL-73-88.

The patent relates to rock stress in a borehole wall determined in situ by obtaining an initial strain reading of the wall, relieving the strain by fracturing the wall from within the borehole with a hydraulic jack, obtaining a relieved strain reading, and using the two strain readings to determine stress.

PB-255 466/5GA PC$3.50
Hawaii Univ., Honolulu.
Is Offshore Sand Mining Feasible.
1972, 5p UNIHI-SG-JC-73-01, NOAA-76032307
Pub. in HB, p63-64, 66-67, May 72.

Descriptors: *Sands, *Beaches, *Hawaii, Sand control, Construction materials, Undersea mineral deposits, Mining, Feasibility.
Identifiers: Reprints, Tourist industry, Sea Grant program.

Hawaii sand is an important part of the state's two main industries--tourism and construction. The work that is being done to recover the sand and to make sand recovery economically feasible is discussed in this article. Two main projects discussed are sand deposits and a submarine sand recovery system (SSRS).

PB-255 471/5GA PC$3.50
Hawaii Inst. of Geophysics, Honolulu.
Manganese Accretion at the Sediment-Water Interface at 400 to 2400 Meters Depth, Hawaiian Archipelago,
Maury Morgenstein. 1971, 9p UNIHI-SG-JC-72-04, HIG-Contrib-451, NOAA-76032311
Pub. in unidentified journal.

Descriptors: *Manganese, *Manganese nodules, *Undersea mineral deposits, Hawaii, North Pacific Ocean, Sediments, Ocean bottom, Ferromanganese, Deep water, Submarine topography.
Identifiers: Reprints, Sea Grant program.

Manganese accretion in the marine environment apparently is not controlled by water depth, pressure or temperature. Ferroman-

ganese nodules have been collected in water as shallow as 5 m in the Hawaiian Archipelago, and large crusts have been discovered on marine terraces between 400 and 2400 m. In these deposits, manganese accretion is controlled by the distribution of lithified detrital ferruginous sediments, apparently deposited by density currents down the island slopes. Precipitation of divalent manganese from sea water on the surface of these ferruginous grains probably initiated growth of the crusts. Shallow manganese samples from the Kauai Channel at 400 m depth are morphologically similar to mushroom-shaped manganese nodules from deep-sea and lacustrine environments.

PB-255 520/9GA Not available NTIS
Oregon State Univ., Corvallis. School of Oceanography.
Crustal Rupture and the Initiation of Imbricate Thrusting in the Peru-Chile Trench,
Roger A. Prince, and L. D. Kulm. Dec 75, 16p NSF/IDOE-76-51
Grant NSF-GX-28675
Pub. in Geological Society of America Bulletin, v86 doc no. 51203 p1639-1653 Dec 75.

Descriptors: *Ocean bottom, *Submarine topography, South Pacific Ocean, Sediments, Tectonics, Ocean ridges, Continental slopes, Basalt, Seismic surveys, Earthquakes, Peru.
Identifiers: Reprints, Peru-Chile Trench, Plate tectonics, International Decade of Ocean Exploration.

A detailed survey of parts of the Peru-Chile Trench between lat 6 degrees and 10 degrees S shows that it has undergone extensive deformation within the past several thousand years. The tholeiitic basalt crust and overlying sedimentary deposits have ruptured, forming ridges within the trench axis and uplifted turbidite basins of former trench fill on the seaward wall of the trench. This study suggests that the oceanic plate is fractured into three segments between lat 6 degrees and 10 degrees S. The bathymetry, structure, nature of vertical movements, sediments of the Peru-Chile Trench and lower continental slope, and first motions of earthquakes on the oceanic plate suggest that imbricate thrusting plays an important role in the development of the features observed at the convergent boundary off Peru.

PB-255 526/9GA Not available NTIS
National Oceanic and Atmospheric Administration, Miami, Fla. Atlantic Oceanographic and Meteorological Labs.
Abyssal Hills of the Eastern Central North Atlantic,
Peter A. Rona, Reginald N. Harbison, and Sam A. Bush. 25 Jan 74, 19p NSF/IDOE-76-54
Pub. in Marine Geology, v16 p275-292 1974.

Descriptors: *Ocean bottom, *Submarine topographic features, *North Atlantic Ocean, Ocean ridges, Abyssal zone, Tectonics.
Identifiers: Reprints, International Decade of Ocean Exploration.

Abyssal hills were delineated in a 185 x 185-km area by an 18.5 x 18.5-km grid of narrow-beam bathymetric and geophysical profiles in oceanic crust of Cretaceous age near 23 degrees N latitude, 31 degrees W longitude. The abyssal hills are similar to features located along flow lines of sea-floor spreading near the crest of the Mid-Atlantic Ridge. This similarity indicates a primary origin for these abyssal hills related to axial processes at a mid-oceanic ridge involving construction (igneous) and tectonics (faulting), and secondary modification by volcanic activity.

PB-255 531/9GA Not available NTIS
Trans-Atlantic Geotraverse, Rockville, Md.
Marine Geology,
Peter A. Rona. 1973, 7p NSF/IDOE-76-65

Descriptors: *Geophysical mineral deposits, *Earth crust, *Continental drift, *North Atlantic Ocean, Marine geology, Petroleum geology, Ocean bottom topography, Undersea mineral deposits, Tectonics, Oceanographic surveys, Natural gas, Sediments.
Identifiers: Plate tectonics, International Decade of Ocean Exploration, Reprints.

In this article a description is given of activities of the Trans-Atlantic Geotraverse's (TAG) research on the evolution of continental margins, sea-floor spreading and occurrence of oil and mineral deposits in the deep ocean basin. TAG's research extends across the central North Atlantic basin between eastern North America at Cape Hatteras, North Carolina and northwestern Africa at Cap Blanc, Mauritania.

PB-255 533/2GA Not available NTIS
National Oceanic and Atmospheric Administration, Miami, Fla. Atlantic Oceanographic and Meteorological Labs.
Mesozoic Plate Motions in the Eastern Central North Atlantic,
Peter A. Rona, and Henry S. Fleming. 1 Feb 73, 15p NSF/IDOE-76-63
Prepared in cooperation with Naval Research Lab., Washington, D.C.
Pub. in Marine Geology, v14 p239-252 1973.

Descriptors: *Fracture zones, *Tectonics, *North Atlantic Ocean, Ocean bottom, Ocean basins.
Identifiers: Reprints, *Plate tectonics, Continental drift.

A 1500 km long segment of a fracture zone exhibiting continuity of trend and offset with the Atlantis fracture zone (30 degrees N) was mapped with bathymetric, seismic reflection, and magnetic profiles between the outer continental shelf and the abyssal hills off northwest Africa. The fracture zone segment occurs in crust of Mesozoic age dated tentatively by the identification of remanent magnetic anomalies. Lithospheric plate motions in a frame of reference fixed with respect to Africa are deduced along the fracture zone.

PB-255 534/9GA Not available NTIS
National Oceanic and Atmospheric Administration, Miami, Fla. Atlantic Oceanographic and Meteorological Labs.
Structural Lineations in the Canary Basin, Eastern Central North Atlantic,
R. N. Harbison, R. K. Lattimore, and Peter A. Rona. 1 Feb 73, 8p NSF/IDOE-76-60
Pub. in Marine Geology, v14 p269-275 1973.

Descriptors: *Ocean bottom, *Submarine topographic features, *North Atlantic Ocean, Ocean basins, Magnetic anomalies, Gravity, Abyssal zone, Tectonics, Fracture zones.
Identifiers: Canary Basin, International Decade of Ocean Exploration.

A corridor 315 km wide centered along the southeast projection of the Atlantis fracture zone between 21 degrees W and 29 degrees W was investigated with seismic reflection, bathymetric, gravity, and magnetic profiles. Six sub-parallel, sediment-filled troughs in acoustic basement trend about 106 degrees across the abyssal hills and lower continental rise off northwest Africa. Where the southernmost structural lineations cross the abyssal plain, they are interrupted by a ridge trending 060 degrees surmounted by volcanic peaks. The structural lineations become less distinct landward of the western margin of the abyssal plain coincident with a decrease in topographic relief on acoustic basement and increasing sediment thickness. This transition is coincident with a reduction in the amplitude of gravity and magnetic anomalies.

PB-255 580/2GA PC$5.50/MF$3.00
National Field Investigations Center-Denver, Colo.
An Application of ERTS Technology to the Evaluation of Coal Strip Mining and Reclamation in the Northern Great Plains.
Final rept.
Feb 75, 120p EPA/330/3-75/001, EPA/330/3-75/001
Prepared in cooperation with Environmental Protection Agency, Denver, Colo. Region VIII.

Descriptors: *Coal mines, *Strip mining, *Reclamation, *Remote sensing, Land use, Vegetation, Spaceborne photography, Maps, Wyoming, North Dakota, South Dakota, Montana.
Identifiers: *Northern Great Plains Region(United States), ERTS satellites, Image processing.

A study was conducted of the coal mines in Wyoming, Montana, North and South Dakota using remote sensing data from Earth Resources Technology Satellite (ERTS). The study documented the size, shape and location of the actively mined area, untouched spoils piles, reclaimed or recontoured areas, newly vegetated areas and abandoned spoils piles within each of the 30 active, inactive or proposed coal mine sites. Land use, or classification, at each mine evaluated was defined by computer processing of ERTS data from digital magnetic tapes. In most cases the computer classification techniques were successful in delineating mine areas, particularly large areas, into active mining and revegetated spoils areas, and graded and ungraded spoils piles.

8H. Hydrology and Limnology

AD-A027 213/8GA PC$4.50/MF$3.00
Geological Survey Menlo Park Calif Water Resources Div
Flood Hydrology of Butte Basin, 1973 and 1974 Water Years, Sacramento Valley, California.
Progress rept.,
R. G. Simpson. Mar 76, 59p Rept nos. USGS/WRD/WRI-76/028, USGS/WRI-36-75

Descriptors: *Floods, Hydrology, California, Data reduction, Rivers, Statistical data, Water resources.
Identifiers: *Butte basin, Sacramento River, Streamflow.

Stage and discharge data are being collected along Ord Ferry Road, Afton Boulevard, State Highway 162, and Gridley Road to describe the flooding of Butte Basin caused primarily by overflow from the Sacramento River. Only minor flooding occurred in Butte Basin during the 1973 water year. Two floods caused significant overflow to Butte Basin during the 1974 water year. Peak overflow along Ord Ferry Road was about 70,000 cu ft/sec on January 17 and was about 38,000 cu ft/sec on March 31. Peak flows measured along Afton Boulevard, State Highway 162, and Gridley Road ranged from about 39,000 to 44,000 cu ft/sec on January 18 and from about 21,000 to 24,000 cu ft/sec on April 1.

PB-255 070/6GA PC$4.00/MF$3.00
Geological Survey, St. Paul, Minn. Water Resources Div.
Digital Models of a Glacial Outwash Aquifer in the Pearl-Sallie Lakes Area, West-Central Minnesota.
Water-resources investigations (Final),
Steven P. Larson, Mark S. McBride, and Ronald J. Wolf. Nov 75, 44p USGS/WRD/WRI-76/041, USGS/WRI-40-75
Prepared in cooperation with Environmental Protection Agency, Washington, D.C.

Descriptors: *Hydrogeology, *Ground water, *Lakes, Aquifers, Surface waters, Mathematical models, Leakage, Seepage, Water flow, Simulation, Pearl Lake, Sallie Lake, Minnesota.
Identifiers: *Aquifer characteristics, *Groundwater movement, Water level fluctuations.

The need for study of lake-ground-water interchange has been accentuated by eutrophication of lakes in the Pearl-Sallie Lakes area of west-central Minnesota. The local groundwater flow system is dominated by an outwash aquifer that is sandwiched between two till layers in the western part of the area and exposed at the land surface in the eastern part. Ground water discharges from the aquifer into lakes in the outwash area but is recharged from lakes in the till-covered area. Irregular aquifer geometry resulted in a complex ground-water flow system. Simulation of the system by areal and vertical-section models showed that the lakes significantly control groundwater flow near their boundaries.

PB-255 108/3GA PC$4.50/MF$3.00
Massachusetts Univ., Amherst. Water Resources Research Center.
Evaluation and Adaptation of Selected Computer Programs to Water Resource Problems in Massachusetts.
Completion rept.,
Lawrence A. Leland, and George R. Higgins.
Jun 75, 74p Pub-67, Completion 76-13, W76-10129, , OWRT-A-070-MASS(1)
Contract DI-14-31-0001-4021

Descriptors: *Hydrology, *Open channel flow, *Data processing, Computer programming, Precipitation(Meteorology), Hydraulics, Evaluation, Massachusetts.
Identifiers: *Hydrologic data, HYDRO system, Hydrographs, Frequency analysis.

The HYDRO programming system consists of a library of computer sub-programs which have been assembled and modified to process hydraulic and hydrologic data under a common format. A total of twenty-five sub-programs are presently included in the system, each of which falls under one of the following categories: Precipitation analyses, frequency analyses, hydrograph analyses, or open channel hydraulics. The twenty-five sub-programs selected provide a broad look at many of the more common problems encountered in the field today. They are intended to introduce the basic system to the engineer, satisfy many of his present needs, and be flexible enough to enable the timely inclusion of future programs.

PB-255 144/8GA PC$10.50/MF$3.00
Geological Survey, Rolla, Mo. Water Resources Div.
Temperature of Missouri Streams,
James E. Bowie. 1971, 354p
Prepared in cooperation with Missouri Geological Survey and Water Resources, Rolla, and Missouri Water Pollution Board, Jefferson City.

Descriptors: *Missouri, *Streams, *River basins, *Water quality, Rivers, Inland waterways, Waterways(Watercourse), Temperature, Tables(Data).

Temperature is one of the more important parameters in determining water quality. The purpose of this report is to compile and make available the temperature data of Missouri streams.

PB-255 175/3GA PC$3.50/MF$3.00
North Central Forest Experiment Station, St. Paul, Minn.
Estimating Water Yield Differences Between Hardwood and Pine Forests: An Application of Net Precipitation Data.
Forest Service research paper,
Elon S. Verry. 25 Apr 73, 19p FSRP-NC-128

Descriptors: *Hydrology, *Water supply, *Forest trees, Ground water recharge, Stream flow, Pine trees, Precipitation(Meteorology), Estimating, Runoff, Tables(Data), Minnesota.
Identifiers: *Water yield, Aspen trees.

The impact of different forest types on streamflow or groundwater recharge must be considered in evaluating multiple-use alternatives. The use of net precipitation differences among hardwood and pine forests as an estimate of water yield differences should not be interpreted as a total explanation of processes affecting water yield. This paper presents net precipitation data for stocking levels of one aspen and three red pine forests in north-central Minnesota.

PB-255 258/6GA PC$4.50/MF$3.00
Environmental Protection Agency, Denver, Colo. Technical Support Branch.
The Meeker Well and Other Phenomena in the Vicinity of the Meeker Dome, Rio Blanco County, Colorado - A Summary Report on the Feasibility of Control of Seepage of Saline Ground Water.
Summary rept.
Dec 72, 61p SA/TSB-15

Descriptors: *Ground water, *Salt water intrusion, *Water wells, Salinity, Monitoring, Seepage, Water quality, Water analysis, Infrared detection, Colorado.
Identifiers: *Water quality data, Meeker(Colorado), Rio Blanco County(Colorado).

The occurrence of saline seeps in the vicinity of the Meeker Dome, near Meeker, Colorado in 1970 caused concern, as expressed by the State of Colorado and landowners. Of special concern was the fact that the seepage occurred less than two years after the plugging of the so-called 'Meeker Well' and the Kritsas 1 and 2 wells. Questions arose, obviously, as to whether 'replugging' of wells would correct the problems caused by seepage and whether land-restoration (to agricultural productivity) methods were available. This report presents the water chemistry and aerial infrared imagery obtained by EPA to assist in the clarification.

PB-255 272/7GA PC$6.75/MF$3.00
Montana Univ., Missoula. Dept. of Geology.
Assessment and Implementation of In-Stream Value Studies for the Northern Great Plains.
Annual rept. no. 2,
Arnold J. Silverman, and Loye Parrish. 1974, 159p
Contract EPA-68-01-2653

Descriptors: *Stream flow, *Tongue River, Sediments, Sediment transport, Ice reporting, Bathymetry, Velocity, Fishes, Maps, Montana.
Identifiers: Northern Great Plains Region(United States).

The objectives of this study include the implementation of a methodology for the recommendation of minimum streamflow on a medium sized river containing a warm-water fish community; an evaluation of the suitability of the methodology; and an evaluation of flow criteria, including nonbiotic factors, used in making the flow recommendation. The Tongue River in southeastern Montana was chosen as the study stream for this project.

PB-255 455/8GA PC$4.50/MF$3.00
Geological Survey, Harrisburg, Pa. Water Resources Div.
Technical Manual for Estimating Low-Flow Frequency Characteristics of Streams in the Susquehanna River Basin.
Final rept.,
Jeffrey T. Armbruster. Jun 76, 72p USGS/WRI-76-51, USGS/WRD/WRI-76/045
Prepared in cooperation with Susquehanna River Basin Commission, Harrisburg, Pa.

Descriptors: *Stream flow, *Susquehanna River, Estimating, Regression analysis, Drainage, Hydrology, Juniata River, Chemung River.
Identifiers: *Low flow frequency.

The report presents procedures for estimating low-flow frequency characteristics for streams in the Susquehanna River Basin. The techniques can be used at ungaged sites as well as sites where insufficient data are available to make a reliable estimate. Streams have been divided into two types-major and minor. Major streams are the Susquehanna, West Branch Susquehanna, Juniata, and Chemung Rivers. Points on these streams with drainage areas of more than 2,000 sq. mi. (5,180 sq. km.) are included in this category. Points on these streams with drainage areas of less than 2,000 sq. mi. fall into the minor stream category. Generally minor streams are herein defined as those draining less than 2,000 sq. mi. (5,180 sq. km.). Multiple-regression techniques have been used to develop relations for estimating the 1-, 3-, 7-, 30-, and 183-day duration low flows at recurrence intervals of 10, 20, 50 and 100 years for annual series data and the 1-, 3-, 7-, and 30-day duration low flows, at the same recurrence intervals, for six individual months, May through October, inclusive.

PB-255 482/1GA PC$4.50/MF$3.00
General Electric Co., Santa Barbara, Calif. TEMPO.
Monitoring Groundwater Quality: Data Management,
Norman F. Hampton. Apr 76, 72p GE75TMP-70, EPA/600/4-76/019
Contract EPA-68-01-0759

Descriptors: *Ground water, *Water quality, *Management information systems, Aquifers, Monitoring, Data processing, Surveys, Hydrogeology, Permeability, Indexes(Documentation), Data storage.
Identifiers: Aquifer characteristics, Hydrologic data, Data management.

The growing concern for subsurface water resources will surely be accompanied by an expanding groundwater data base, a data base which is already quite large. This report is intended to point the way towards the efficient management of this data base which will assure that pertinent information is available when and where it is needed. The discussion describes the requirements of groundwater data management, survey some available capabilities which may serve to satisfy these requirements and identify the means by which these capabilities can be used to accomplish the management of groundwater data.

PB-255 633/9GA PC$4.50/MF$3.00
Illinois State Water Survey, Urbana.
Public Groundwater Supplies in McHenry County,
Dorothy M. Woller, and Ellis W. Sanderson.
1976, 56p ISWS/BUL-60(19)/76, W76-10719

Descriptors: *Water supply, *Ground water, Aquifers, Water wells, Gravel, Sands, Municipalities, Hydrogeology, Water analysis, Chemical properties, Iron, Permeability, Water quality, Estimating, Output, Illinois.
Identifiers: *McHenry County(Illinois), Water yield, Aquifer characteristics.

All available information was reported on production wells used for public groundwater supplies in McHenry County, Illinois. Sand and gravel deposits in the unconsolidated materials above bedrock are tapped by 26 public water systems in McHenry County as a source of all or part of their water supply. There are presently

43 production and standby wells, ranging in depth from 47 to 272 ft, tapping only the sand and gravel deposits. Their reported yields range from 15 to 1350 gpm depending primarily upon the type of well and the permeability, thickness, and areal extent of the sand and gravel unit tapped by each well. Production from these wells in 1973-1975 was estimated to be about 6,550,000 gpd. The analyses of water from these wells show that the iron content ranges from 0.0 to 3.9 mg/l and the hardness from 204 to 512 mg/l. Individual production wells for each supply were described in the order of their construction.

PB-255 715/5GA PC$7.50/MF$3.00
New Mexico State Univ., University Park. Water Resources Research Inst.
Trophic Status of Selected Northern New Mexico Lakes.
Technical completion rept.,
Gordon V. Johnson, and Larry L. Barton. Jun 76, 193p WRRI-074, W76-10808, , OWRT-A-053-NMEX(1)

Descriptors: *Lakes, *Limnology, *Water quality, Primary biological productivity, Water analysis, Bacteria, Algae, Concentration(Composition), Nutrients, Plankton, Nitrogen, Phosphorus, Fenton Lake, Hopewell Lake, Lagunitas Lakes, Eagle Nest Lake, New Mexico.
Identifiers: *Trophic level, Eutrophication.

A characterization of the algae, the bacteria, and the chemical and limnological conditions in Fenton Lake, Hopewell Lake, the Lagunitas Lakes, and Eagle Nest Lake was conducted to determine the tropic status of these northern New Mexico Lakes. The investigation was initiated after algal blooms were reported regularly during the summer on these lakes which represent different physical and biological environments. The tropic status for each lake was assessed based on primary productivity, nutrient levels, and predominant phytoplankton genera.

PB-255 796/5GA PC$6.00/MF$3.00
Illinois State Water Survey, Urbana.
Groundwater Availability in Champaign County.
E. W. Sanderson, and E. Zewde. 1976, 143p ISWS/CIR-124/76, W76-10718

Descriptors: *Ground water, *Water wells, *Water supply, Aquifers, Glacial deposits, Hydrogeology, Subsurface drainage, Water quality, Pumping, Water table, Water analysis, Concentration(Composition), Iron, Availability, Illinois.
Identifiers: Champaign County(Illinois), *Water yield.

Groundwater in Champaign County normally can be obtained from one of three primary water-bearing sand and gravel units within the glacial drift materials. These materials were deposited on top of the bedrock formations during three ages of glaciation. The lower aquifer system is associated with a major bedrock valley in the northwest portion of Champaign County. About 84% of the county's water supply is pumped from this sand and gravel aquifer. Groundwater from the glacial deposits is hard (250 to 600 mg/l) and normally contains objectionable concentrations of iron (1 to 5 mg/l). These undesirable constituents can be successfully removed with home or municipal treatment units. An estimated 23.3 million gallons a day (mgd) of water is pumped from the aquifers of Champaign County to satisfy industrial, municipal, domestic, and rural needs. A much larger quantity of water, perhaps as much as 90 mgd, could probably be withdrawn without overdevelopment. This report describes pertinent geologic factors, groundwater occurrence and movement, temperature and chemical quality, and well development.

8I. Mining Engineering

NTIS/PS-76/0597/5GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Mine Safety. Part 1. Fires and Explosions (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
Edward J. Lehmann. Jul 76, 116p*
Supersedes NTIS/PS-75/562.

Descriptors: *Bibliographies, *Coal mines, *Mine fires, *Fires, *Underground explosions, Methane, Flame propagation, Deflagration, Gas dynamics, Combustion products, Plastics, Wood, Burning rate, Combustion, Coal dust, Dust explosions, Safety engineering, Fire safety, Electric sparks.
Identifiers: *Mine safety.

The cited reports cover research on underground mine fires and explosions, as well as safety and prevention measures. The primary concern is with methane and coal dust explosions. Safety barriers, dust control, combustion products, fire sensors, fire suppression, metal spark inhibition, and dust explosions are all included. (This updated bibliography contains 110 abstracts, 30 of which are new entries to the previous edition.)

NTIS/PS-76/0598/3GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Mine Safety. Part 2. Communication and Position Finding Systems (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
William E. Reed. Jul 76, 66p*
Supersedes NTIS/PS-75/563.

Descriptors: *Bibliographies, *Mines(Excavations), *Telecommunication, *Position finding, *Coal mines, Mining engineering, Rescue systems, Detection, Safety, Electromagnetic noise.
Identifiers: *Mine safety, Underground communications.

Federally-sponsored research reports are cited which cover underground mine communications and trapped miner location. The topics include operational and emergency communication systems, detection and position finding by electromagnetic and seismic means, and electromagnetic noise in mines. (This updated bibliography contains 61 abstracts, 8 of which are new entries to the previous edition.)

NTIS/PS-76/0601/5GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Mine Safety. Part 5. General Studies (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
Edward J. Lehmann. Jul 76, 180p*
Supersedes NTIS/PS-75/566, and COM-74-11223.

Descriptors: *Bibliographies, *Mines(Excavations), *Coal mines, *Safety engineering, Gas detectors, Mine gases, Mining equipment, Protectors, Safety devices, Mine cars, Roofs, Coal mining, Barriers, Blasting, Dust control, Coal dust.
Identifiers: *Mine safety.

The bibliography includes studies concerning blasting safety, rescue operations, toxic and flammable gas detection, safety barriers, machinery safety design, and safety techniques in excavation and tunnel supports. Excluded are reports on mine fires and explosions, occupational health, communication systems, and trapped miner location detection. These are covered in the first 4 parts. (This updated bibliography contains 175 abstracts, 54 of which are new entries to the previous edition.)

NTIS/PS-76/0627/0GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Offshore Drilling (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Guy E. Habercom, Jr. Aug 76, 155p*
Supersedes NTIS/PS-75/540, and NTIS/PS-74/103.

Descriptors: *Bibliographies, *Offshore drilling, Undersea mineral deposits, Gas wells, Oil wells, Ocean environments, Environmental impacts, Drilling rigs, Law(Jurisprudence), Abstracts.

Drilling procedures, equipment, environmental aspects, and legal implications involved in oceanic mineral resources recovery are investigated. (This updated bibliography contains 154 abstracts, 38 of which are new entries to the previous edition.)

PATENT-3 956 116 Not available NTIS
Department of the Interior, Washington, D.C.
Process for Separating Liquids from Suspensions.
Patent,
L. Warren Brandt. Filed 18 Oct 74, patented 11 May 76, 6p PB-255 373/3, PAT-APPL-515 390
Supersedes PB-243 949.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Colloids, *Dispersions, *Separation, *Patents, Phosphate deposits, Slime, Screenings.
Identifiers: PAT-CL-210-42, *Phosphate rock slime.

This invention relates to a process for accelerating the separation of liquid from solids in a very slow-settling suspension or a slime, by means of a single mechanical operation which effects the compaction of the solids in a relatively short period of time. The process involves the movement of a relatively large mesh screen or net through the suspension at a slow steady rate with the result that the solid material is concentrated or compacted ahead of the moving screen leaving a clarified liquid behind the moving screen. In some instances, there may be a flocculant material employed as an aid in agglomerating the ultrafine solids, but this is not a step which is necessary to the process of this invention. This process has been employed successfully with phosphate slimes resulting from commercial mining operations in Florida.

PATENT-3 956 544 Not available NTIS
Department of the Interior, Washington, D.C.
Pressure Sensitive Explosion Barrier.
Patent,
Israel Liebman, John Corry, and J. Kenneth Richmond. Filed 2 Jul 75, patented 25 May 76, 7p PB-255 367/5, PAT-APPL-592 488
Supersedes PB-245 355.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Doors, *Blast loads, *Patents, Pressure sensors, Explosions, Mines(Excavations), Differential pressure, Safety engineering, Coal mines.
Identifiers: *Blast doors, *Explosion suppressors, PAT-CL-169-56.

The patent relates to a pressure sensitive explosion barrier which is activated by a static pressure rise. A liquid tight housing with a latched door contains the explosive suppression agent, usually water, until activation takes place. Upper hinges on the door allow it to be pivoted outwardly and its agent released. Normally a latch keeps the door locked until the pressure rise from the explosion causes a connected bellows assembly to be depressed. Once depressed, the latch is released and the door is forced outwardly by a biasing member to release the agent before the explosion arrives.

PATENT-3 960 217
Not available NTIS
Department of the Interior, Washington, D.C.
Passive Explosion Barrier.
Patent,
Israel Liebman, and John Corry. Filed 14 Oct 75, patented 1 Jun 76, 9p PB-255 374/1, PAT-APPL-622 343
Supersedes PB-246 956.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Mines(Excavations), *Underground explosions, *Barriers, *Patents, Detonation waves, Suppressors, Containers, Supports.
Identifiers: PAT-CL-169-64, *Blast doors, *Explosion suppressors.

The invention relates generally to explosion barriers for mines, or the like, and more particularly to a passive explosion barrier that is responsive to relatively low velocity, as well as intermediate and high velocity explosion generated wind, but is not responsive to relatively small accidental disturbances.

PATENT-3 967 455
Not available NTIS
Department of the Interior, Washington, D.C.
Controlled Yielding Rock Bolt.
Patent,
John P. Conway. Filed 3 Feb 75, patented 6 Jul 76, 6p PB-255 380/8, PAT-APPL-546 841
Supersedes PB-244 363.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Rock bolts, *Patents, Anchor bolts, Thread cutting, Die cutting, Underground supporting, Mines(Excavation).
Identifiers: PAT-CL-61-45.

The patent relates to a bolt assembly for supporting a mine roof or the like having a yieldable coupling means at least at one end to allow controlled sagging of the rock to prevent exceeding the elastic limit of the bolt. An expandable anchor may be provided at the other end. The coupling means includes a collar having a die movable along deformable threads of the bolt when the rock load increases. This relative movement provides relief thereby assuring against the bolt becoming excessively tensioned. The die deforms the threads by cold-flow extruding and flattening action against the crest of the threads. This action forms a frictional holding interface between the bolt and the collar and maintains substantially constant tension in the bolt. A nut on the collar transmits the supporting force to the rock face. A removable cap nut may be threaded onto the bolt to properly pre-position the parts and transmit torque to the anchor during installation.

PB-252 101/1GA PC$10.75/MF$3.00
FMC Corp., San Jose, Calif. Mining Equipment Operations.
Inherently Safe Mining Systems. Phase II. Interim Report (Conventional).
Interim rept. Feb 72-Mar 74.
Jan 76, 384p BuMines-OFR-88-75r
Contract H0111670
Supersedes report dated Jul 75, PB-248 625.

Descriptors: *Mining equipment, *Safety engineering, Face preparation(Mining), Systems engineering, Coal mines, Accident prevention, Revisions, Mine cars, Canopies, Control equipment.
Identifiers: ISMS(Inherently Safe Mining Systems), *Inherently safe mining systems, Jenny Mine, Martin County(Kentucky).

The Jenny Mine, a single section, was developed in the Stockton seam near Inez, Martin County, Ky. Two shuttle cars, a face drill, loading machine, cutting machine, and a cleanup scoop were purchased. These were modified by adding protective cabs or canopies and revising the controls. Controls were simplified and grouped in a task-oriented arrangement. Communications and lighting were added to all face equipment. Testing and various data gathering exercises were performed. The report compares results obtained with the results of other operations as well as with results that may be expected.

PB-254 925/1GA PC$9.25/MF$3.00
Middle Atlantic Governors' Coastal Resources Council.
Identification and Analysis of Mid-Atlantic Onshore OCS Impacts.
Feb 76, 284p* RA-75-46C, FEA/G-76/279
Contract FEA-CA-05-50078-00
Prepared by Resources Planning Associates, Cambridge, Mass.

Descriptors: *Offshore operations, *Coastal zone management, *Energy policy, Economic impact, Environmental impacts, Social effect, Land use, New Jersey, Virginia, Delaware, Continental shelves, Alaska Gulf, Leasing, Legislation, Regulations, Maryland, New York, Reviewing.
Identifiers: Middle Atlantic Region(United States).

This report evaluates recent literature on onshore socioeconomic and environmental impacts related to Outer Continental Shelf oil and gas recovery indicates required management decisions and policy choices for the next decade, and recommends additional study needs.

PB-255 125/7GA PC$5.50/MF$3.00
Environmental Protection Agency, Denver, Colo. Region VIII.
Accomplishment Plan, Region VIII, Covering EPA Activities Relating to Oil Shale (Colorado, Utah, Wyoming).
Sep 74, 110p

Descriptors: *Oil shale, *Project planning, Environmental impacts, Economic impact, Social effect, Energy policy, Legislation, Regulations, Colorado, Utah, Wyoming.
Identifiers: Rocky Mountain Region(United States).

The report presents the rationale and allocation of EPA resources to carry out its responsibilities in light of major oil shale development in the Rocky Mountain States of Colorado, Utah, and Wyoming. The Plan addresses primarily a regionally-coordinated effort, although the magnitude of potential development calls for additional participation by EPA and local and National groups.

PB-255 320/4GA PC$3.50/MF$3.00
Lewin and Associates, Inc., Washington, D.C.
Economic Limits of OCS Production Wells.
Apr 76, 13p FEA/B-76/317
Contract FEA-CO-03-50222-00

Descriptors: *Offshore operations, Offshore platforms, Crude oil, Continental shelves, Cost analysis, Operating costs, Production rate, Mexico Gulf.

This report examines the costs of OCS (Outer Continental Shelf) oil production. Operating and maintenance costs and the economic life of offshore platforms are discussed.

PB-255 361/8GA PC$5.00/MF$3.00
Bureau of Mines, Pittsburgh, Pa. Pittsburgh Mining Research Center.
Coal Mine Illumination. Proceedings: Bureau of Mines Technology Transfer Seminars. Pittsburgh, Pa., November 4, 1975; St. Louis, Mo., November 6, 1975; and Denver, Colo., November 11, 1975.
Information circular 1976.
Jun 76, 87p BuMines-IC-8709

Descriptors: *Mine lighting, *Meetings, Coal mines, Technology transfer, Lighting equipment, Standards, Safety, Mercury lamps, Fluorescent lamps, Sodium lamps, Direct current, Underground mining.
Identifiers: Mine safety.

Research personnel from the Bureau of Mines, representatives of the Mining Enforcement and Safety Administration (MESA) and the mining industry met with other government and industry representatives at three seminars held in Pittsburgh, Pa., November 4, 1975; St. Louis, Mo., November 6, 1975; and Denver, Colo., November 11, 1975, to discuss the results of Bureau-sponsored research in the area of coal mine illumination. The program, aimed at developing suitable illumination systems for the working places of underground coal mines, covered the areas of hardware development, field evaluation of same, and the status of proposed MESA standards and proposed MESA enforcement procedures. These proceedings contain the opening remarks to the seminar and eight technical presentations based on various aspects of coal mine illumination.

PB-255 421/0GA PC$4.00/MF$3.00
Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
A Master Environmental Control and Mine System Design Simulator for Underground Coal Mining. Volume I. Executive Summary.
R. V. Ramani, and C. B. Manula. 18 Dec 75, 31p
BuMines-OFR-84-76-Vol-1
Grant GO111808
Also available in set of 11 reports as PB-255 420-SET, PC$79.25/MF$14.75.

Descriptors: *Underground mining, *Coal mining, *Environment simulation, Mine ventilation, Mine haulage, Underground supporting, Mine gases, Subsidence, Production models, Cost engineering, Subsurface drainage, Systems engineering, Engineering geology, Computerized simulation.
Identifiers: *Computer applications.

This report is volume 1 of an 11-volume report on a dynamic general purpose computer simulation model for underground coal mining. The simulator has a wide range of possible applications in the design and evaluation of underground coal mining systems from the standpoints of health and safety, productivity, and

mine environment. The Master Design Simulator consists of nine free-standing function-oriented subsystem models linked together into an integrated, comprehensive model of an entire mining system. The subsystems comprising the Master Design Simulator include geology and reserves, methane generation, roof support, subsidence, production, rail haulage, cost, water generation, and ventilation. This volume of the final report contains a statement of the purpose and scope of work, and provides an overview of the Master Design Simulator with a brief description of each subsystem. A discussion of several areas of application for the simulator is also included.

PB-255 422/8GA PC$7.75/MF$3.00
Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
A Master Environmental Control and Mine System Design Simulator for Underground Coal Mining. Volume II. Geology and Reserves Subsystem.
Final rept.,
R. V. Ramani, P. M. T. White, and D. Sutton. 31 Mar 74. 210p BuMines-OFR-84-76-Vol-2
Grant G0111808
Also available in set of 11 reports as PB-255 420-SET, PC$79.25/MF$14.75.

Descriptors: *Underground mining, *Coal mining, *Environment simulation, Engineering geology, Computerized simulation, Fossil fuel deposits, Production allowables, Computer programs, User needs.
Identifiers: *Computer applications.

This report is volume 2 of an 11-volume report on a dynamic general purpose computer simulation model for underground coal mining. This volume describes the geology and reserves subsystem of the Master Design Simulator. The two functions of this subsystem are: (1) the design of a geological data library to provide input to the other subsystems of the simulator, and (2) the calculation of coal reserves and associated values and grades under various user-specified conditions. The subsystem uses a weighted moving average method to interpolate between the borehole values, and provides output in report format, graphical plots, and/or storage on magnetic tape or other storage devices for later retrieval. The application of the subsystem as an independent model with test results and comparisons with other methods of computing reserves is also presented. The appendix comprises a user's manual for the model and includes a program listing.

PB-255 423/6GA PC$5.00/MF$3.00
Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
A Master Environmental Control and Mine System Design Simulator for Underground Coal Mining. Volume III. Methane Generator.
Final rept.,
R. V. Ramani, and A. S. C. Owili-eger. 31 Mar 74. 81p BuMines-OFR-84-76-Vol-3
Grant G0111808
Also available in set of 11 reports as PB-255 420-SET, PC$79.25/MF$14.75.

Descriptors: *Underground mining, *Coal mining, *Environmental simulation, Methane, Mine gases, Gas flow, Rates(Per time), Finite difference theory, Computer programs, User needs, Computerized simulation.
Identifiers: *Computer applications.

This report is volume 3 of an 11-volume report on a dynamic general purpose computer simulation model for underground coal mining. This volume of the report describes the methane generator subsystem of the Master Design Simulator. This subsystem is used to determine methane emission rates into the mine environment. These flow rates are then used by the simulator in planning primary and secondary ventilation systems, planning a methane drainage system, and analyzing complex ventilation networks. Both steady-state and unsteady-state gas flows are included, and have been modeled as second order nonlinear partial differential equations. Finite difference equations are used to obtain numerical solutions to the models using a central differencing scheme. An application of the model is presented. The appendices include derivation of the gas flow equations used in the model as well as a user's manual for the computer program.

PB-255 424/4GA PC$4.50/MF$3.00
Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
A Master Environmental Control and Mine System Design Simulator for Underground Coal Mining. Volume IV. Roof Support. Subsystem.
Final rept.,
C. B. Manula, B. Mozumdar, and D. K. Jeng. 30 Jun 74. 72p BuMines-OFR-84-76-Vol-4
Grant G0111808
Also available in set of 11 reports as PB-255 420-SET, PC$79.25/MF$14.75.

Descriptors: *Underground mining, *Coal mining, *Environmental simulation, Underground supporting, Rock bolts, Geologic structures, Computerized simulation, Computer programs, User needs.
Identifiers: *Computer applications.

This report is volume 4 of an 11-volume report on a dynamic general purpose computer simulation model for underground coal mining. This volume describes the roof support subsystem of the Master Design Simulator. This model is based on popular roof support practices for different geological environments with related restrictions imposed by the Coal Mine Health and Safety Act of 1969. From geological sections, the model determines the anchor horizon for roof bolts and the density of roof support necessary. The roof support subsystem is tied to both the geology and reserves subsystem and the production subsystem of the Master Design Simulator, but can also operate as a free-standing model. Several case studies are presented showing the application of the model. A detailed user's manual, including a program listing, is presented in the appendices.

PB-255 425/1GA PC$7.50/MF$3.00
Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
A Master Environmental Control and Mine System Design Simulator for Underground Coal Mining. Volume V. Subsidence Subsystem.
Final rept.,
C. B. Manula, B. Mozumdar, and D. K. Jeng. 30 Jun 74. 199p BuMines-OFR-84-76-Vol-5
Grant G0111808
Also available in set of 11 reports as PB-255 420-SET, PC$79.25/MF$14.75.

Descriptors: *Underground mining, *Coal mining, *Environmental simulation, Earth movements, Subsidence, Geologic structures, Finite element analysis, Computerized simulation, Computer programs, User needs.
Identifiers: *Computer applications.

This report is volume 5 of an 11-volume report on a dynamic general purpose computer simulation model for underground coal mining. This volume describes the subsidence subsystem of the Master Design Simulator. This subsystem uses the finite method to simulate ground movement caused by an advancing mining face in an underground coal mine. The model is structured around the concept that the ground mass is a layered media of different thicknesses and material properties. Gob areas are considered to be unfilled with broken rock at the beginning of mining. After mining starts, the gob areas are filled with broken material which provides resistance to the lowering of the overlying strata. The model is tied to the geology and reserves subsystem, but it can also operate as a free-standing routine. A case study is presented illustrating the application of the model. A detailed user's manual, including a program listing, is included in the appendices.

PB-255 426/9GA PC$10.00/MF$3.00
Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
A Master Environmental Control and Mine System Design Simulator for Underground Coal Mining. Volume VI. Production Subsystem.
Final rept.,
C. B. Manula, A. Bouillot, R. Rivell, and R. Sanford. 30 Jun 74, 327p BuMines-OFR-84-76-Vol-6
Grant G0111808
Also available in set of 11 reports as PB-255 420-SET, PC$79.25/MF$14.75.

Descriptors: *Underground mining, *Coal mining, *Environmental simulation, Production models, Production allowables, Materials handling, Production control, Computerized simulation, Computer programs, User needs.
Identifiers: *Computer applications.

This report is volume 6 of an 11-volume report on a dynamic general purpose computer simulation model for underground coal mining. This volume describes the production subsystem of the Master Design Simulator. This subsystem provides the means for moving the model through time on a computer and recording its behavior. The logic of the production subsystem can accommodate multiple face units and both standard and nonstandard activities in each mining section. Each activity is assigned a specific and separate list of instructions for the simulation. These instructions include determination of tramming paths, wait and change point locations, entry and cut locations, as well as commands to advance in the mining cycle and tram. Advancing through the mining cycle is handled through a sequential execution of a subset of face jobs that is predetermined in the program logic. A case study is presented illustrating the application of the model as a free-standing program. The appendices comprise a user's manual for the subsystem, and include a program listing.

PB-255 427/7GA PC$10.00/MF$3.00
Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
A Master Environmental Control and Mine System Design Simulator for Underground Coal Mining. Volume VII. Rail Haulage Subsystem.
Final rept.,
C. B. Manula, R. A. Rivell, and R. L. Sanford. 30 Jun 74, 327p BuMines-OFR-84-76-Vol-7
Grant G0111808
Also available in set of 11 reports as PB-255 420-SET, PC$79.25/MF$14.75.

Descriptors: *Underground mining, *Coal mining, *Environmental simulation, Mine haulage, Mine cars, Materials handling equipment, Production control, Computerized simulation, Computer programs, User needs.
Identifiers: *Computer applications.

This report is volume 7 of an 11-volume report on a dynamic general purpose computer simulation model for underground coal mining. This volume describes the rail haulage subsystem of the Master Design Simulator. This subsystem can be used as a free-standing model or can be linked to the production subsystem to provide rail haulage capability. Complex rail haulage systems can be realistically simulated with this model. This report includes complete instruc-

tions for operating the subsystem as well as a program listing. In addition, a case study is included that illustrates the application of the subsystem when linked to the production subsystem.

PB-255 428/5GA PC$9.00/MF$3.00
Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
A Master Environmental Control and Mine System Design Simulator for Underground Coal Mining. Volume VIII. Cost Subsystem.
Final rept.,
R. V. Ramani, J. A. McClay, and V. T. Burgos. 13 Feb 75, 262p BuMines-OFR-84-76-Vol-8
Grant G0111808
Also available in set of 11 reports as PB-255 420-SET, PC$79.25/MF$14.75.

Descriptors: *Underground mining, *Coal mining, *Environment simulation, Production models, Cost engineering, Discounted cash flow, Computerized simulation, Computer programs, User needs.
Identifiers: *Computer applications, *Cost modeling.

This report is volume 8 of an 11-volume report on a dynamic general purpose computer simulation model for undergroun coal mining. This volume describes the cost subsystem of the Master Design Simulator. This subsystem provides for the projection of costs and investment analysis of operations over time using data generated by the Master Design Simulator subsystems and data libraries. This model incorporates a direct costing feature for use in conjunction with the MDS, and considers labor, capital, and operating costs. While the Model is capable of independent use, the direct costing of supplies and other operating elements is sacrificed in the absence of the systems simulator. The model generates cost reports covering each shift of operation for each mining section. Optionally, cost summaries are generated for each day, month, and year of operation. Finally, a discounted cash flow analysis is performed to determine the selling price of the coal mined. The report includes detailed instructions for operating the model and a program listing.

PB-255 429/3GA PC$9.75/MF$3.00
Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
A Master Environmental Control and Mine System Design Simulator for Underground Coal Mining. Volume IX. Water Generator.
Final rept.,
C. B. Manula, and A. Owili-Eger. 30 Sep 75, 303p BuMines-OFR-84-76-Vol-9
Grant G0111808
Also available in set of 11 reports as PB-255 420-SET, PC$79.25/MF$14.75.

Descriptors: *Underground mining, *Coal mining, *Environment simulation, Ground water, Subsurface drainage, Liquid saturation, Finite difference theory, Finite element analysis, Computerized simulation, Computer programs, User needs.
Identifiers: *Computer applications, *Mine drainage.

This report is volume 9 of an 11-volume report on a dynamic general purpose computer simulation model for underground coal mining. This volume describes the water generator subsystem of the Master Design Simulator. This subsystem simulates the flow of water through a typical watershed-reservoir combination to predict mine drainage quantities in underground workings. The model is an integrated one that handles both the unsaturated and the saturated flow domains as a unified system. The solution of the model is achieved by numerical techniques of finite difference method coupled with finite elements analysis. The water generator can be operated either as a free-standing model or in connection with the geology and reserves subsystem as a part of the Master Design Simulator. A case study is including illustrating the application of the model to actual data. The appendices of the report constitute a user's manual for the program, and include a program listing.

PB-255 430/1GA PC$5.50/MF$3.00
Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
A Master Environmental Control and Mine System Design Simulator for Underground Coal Mining. Volume X. Ventilation Subsystem.
Final rept.,
R. V. Ramani, A. Owili-Eger, and C. B. Manula. 30 Sep 75, 116p BuMines-OFR-84-76-Vol-10
Grant G0111808
Also available in set of 11 reports as PB-255 420-SET, PC$79.25/MF$14.75.

Descriptors: *Underground mining, *Coal mining, *Environment simulation, Mine ventilation, Environmental engineering, Network analysis theory, Computerized simulation, Computer programs, User needs.

This report is volume 10 of an 11-volume report on a dynamic general purpose computer simulation model for underground coal mining. This volume describes the ventilation subsystem of the Master Design Simulator. The ventilation subsystem has the capabilities to handle: (1) branches in parallel or series, (2) fans in parallel or series, (3) multiple fans, (4) methane, compressed air, or other injections into the system, (5) leakages and fixed quantities, and (6) calculations of absolute pressure at nodes. The program uses the Kirchoff's Junction and mesh laws, and the Hardy-Cross iterative technique to converge to the desired accuracy in solving for the head quantity. A case study is included in the report illustrating the use of the model. The appendices of the report constitute a user's manual for the ventilation subsystem, and include a program listing.

PB-255 431/9GA PC$16.25/MF$3.00
Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
A Master Environmental Control and Mine System Design Simulator for Underground Coal Mining. Volume XI. Total Systems Application.
Final rept.,
C. B. Manula, R. A. Rivell, and R. V. Ramani. 1 Mar 75, 620p BuMines-OFR-84-76-Vol-11
Grant G0111808
Also available in set of 11 reports as PB-255 420-SET, PC$79.25/MF$14.75.

Descriptors: *Underground mining, *Coal mining, *Environment engineering, Mine ventilation, Mine haulage, Underground supporting, Mine gases, Subsidence, Production models, Cost engineering, Subsurface drainage, Systems engineering, Engineering geology, Computerized simulation, West Virginia, Computer programs.
Identifiers: *Computer applications.

This report is volume 11 of an 11-volume report on a dynamic general purpose computer simulation model for underground coal mining. This volume describes the construction and application of the Master Design Simulator as an integrated simulator of an entire underground coal mining system. A discussion of subsystem organization and development is presented, along with execution instructions for various computers, simulation techniques and limitations, and a case study based on data from a coal mine in West Virginia. The cast study illustrates the use of both the interactive or dynamic subsystems (production, rail haulage, roof support, methane generator) and the event-oriented subsystems (geology and reserves, subsidence, cost, water generator, ventilation), and provides information necessary to link the subsystems together. The appendices constitute a user's manual for the linked dynamic subsystems, and include a complete program listing.

PB-255 446/0GA PC$3.50/MF$3.00
Bureau of Mines, Washington, D.C.
Dust Control at a Transfer Point Using Foam and Water Sprays.
Technical progress rept.,
Richard J. Seibel. May 76, 17p BuMines-TPR-97

Descriptors: *Dust control, *Air pollution abatement, Coal mines, Spraying, Belt conveyors, Foam, Water, Transferring, Coal dust, Feeders.
Identifiers: Respirable dust, Water sprays.

The Bureau of Mines studied the effectiveness of foam in controlling airborne dust along a mine section belt line, using personal gravimetric samplers to obtain the data. Although foam was significantly more effective than water sprays in controlling airborne respirable dust at a transfer point and along a mine section belt line, a strategically arranged water spray system may be sufficiently satisfactory and comprise a more economical and convenient dust control method. Also, the section belt to main belt transfer point is a significant dust source, and additional foam or water sprays may need to be applied at such transfer points to alleviate respirable dust generation. The application of foam or water spray to the underside of the belt is especially effective for dust control.

PB-255 499/6GA PC$4.00/MF$3.00
Bureau of Mines, Denver, Colo. Denver Mining Research Center.
Calibration Models for Geophysical Borehole Logging.
Rept. of investigations,
James J. SnoJgrass. Jun 76, 27p BuMines-RI-8148

Descriptors: *Well logging, Calibrating, Geophysics, Models, Geophysical prospecting, Boreholes.
Identifiers: Geologic models.

The Bureau of Mines designed and constructed a series of calibration models for geophysical borehole logging at the Denver Federal Center, Denver, Colo. The models are available for use by government agencies and private industry to calibrate logging equipment for measurements of density, sonic velocity, magnetic susceptibility and electrical resistivity. A nominal hole diameter of three inches was selected as representative of typical core holes drilled for mining and engineering purposes, although additional hole diameters of 2, 5, and 8 inches are provided in one of the models for determination of empirical correction factors for variations in hole diameter. The physical properties of the models were determined by laboratory analyses of drill core samples and evaluated statistically for reliability. This report outlines the location of the models, elements of design and construction, and results of the laboratory tests.

PB-255 583/7GA PC$5.00/MF$3.00
National Enforcement Investigations Center, Denver, Colo.
Impacts of Uranium Mining and Milling on Surface and Potable Waters in the Grants Mineral Belt, New Mexico.
Sep 75, 85p EPA/330/9-75/001
Prepared in cooperation with Environmental Protection Agency, Dallas, Tex. Region VI.

Descriptors: *Uranium ore deposits, *Water pollution, New Mexico, Government policies, Regulations, Legislation, National government, State government, Local government, Mining, Industrial wastes, Water analysis, Sources.

Identifiers: Uranium industry, Water pollution sampling, Grants Mineral Belt.

On September 25, 1974 NMEIA requested EPA Region VI to conduct a survey of water-pollution sources and surface and ground-water quality in the Grants Mineral Belt. Studies conducted from February 24 to March 6, 1975 included industrial waste source evaluation, potable water sampling, and limited stream surveys by NEIC, and ground-water evaluations by ORP-LVF. This report presents the findings of analyses of surface water streams, potable water supplies, and industrial discharges. Appendix C contains raw data for all samples collected during the survey and analyzed by NEIC. The NEIC analysis, when combined with the ORP-LVF report, will present an overall study of water quality in the Grants Mineral Belt.

PB-255 728/2GA PC$12.00/MF$3.00
Hittman Associates, Inc., Columbia, Md.
Underground Coal Mining: An Assessment of Technology.
Final rept.
Jul 76, 475p* EPRI/AF-219
Prepared in cooperation with Pennsylvania State Univ., University Park, and George Washington Univ., Washington, D.C.

Descriptors: *Coal mining, *Technology assessment, Underground mining, Mining engineering, Trends, Production rate, Economic impact, Environmental impacts.

The report is of a study, project 284-1, to provide government and industrial decision-makers with an understanding of alternative technologies available for increasing the production of coal by underground mining in the time frame 1974 - 2000. Apply the methodology, techniques, and processes of technology assessment to domestic underground mining of coal; identify advanced technologies and systems for increased production of deep mined coal and develop alternative R&D and institutional strategies that may make such technologies viable; identify major areas of uncertainty facing the future of the underground coal mining industry, determine the sensitivity of increased production to these uncertainties and formulate strategies and timetables for the resolution of the uncertainties; identify major alternatives for filling institutional gaps, if any, between the various industries involved in the extraction and utilization of underground mined coal; and determine alternative levels of underground mine productive capacity by coal mining region in the United States.

PB-255 799/9GA PC$4.50/MF$3.00
Ocean Energy Inc., Blairsville, Pa.
Development of Illumination Systems for Low Coal Mines.
Open file rept.,
Albert Ketler, and Russell Pellman. 28 Jan 76, 58p BuMines-OFR-85-76
Contract H0242048

Descriptors: *Mine lighting, Coal mines, Fluorescent lamps.

As a result of early experiments in underground mine illumination, the Bureau of Mines recognized the need for additional experience with the underground lighting of coal mines having low coal seam thickness. The article reports the results of several fluorescent illumination installations in mines operating in low seam coal.

8J. Physical Oceanography

AD-A027 216/1GA PC$6.00/MF$3.00
Scripps Institution of Oceanography La Jolla Calif
Mean TS Curves in the Pacific and Their Application to Dynamic Height Computations.
Richard T. Wert, and William J. Emery. 22 Apr 76, 127p Rept no. SIO-Ref-76-6
Contract N00014-75-C-0152

Descriptors: Oceanography, *Oceanographic data, *Salinity, *Thermoclines, Curve fitting, *North Pacific Ocean, Heat transfer, Distribution, Graphics, Standard deviation, Computations, Temperature.
Identifiers: Water mass distribution.

Smoothed mean curves of temperature versus salinity are computed from all available hydrographic data for 10 deg squares in the Pacific between 20S and 40N. Together these curves provide information on the distribution of water masses. Graphs of the individual curves are presented which include the scatter of TS pairs and the standard deviation in salinity along each curve. Salinity at a temperature interval of 1 C is also given in tabular form for each curve. (Author)

AD-A027 593/3GA PC$5.00/MF$3.00
Hawaii Inst of Geophysics Honolulu
The Kinetics of Silica Dissolution from Volcanic Glass in the Marine Environment.
Master's thesis,
Glenn Charles Sicks. Dec 75, 93p Rept no. HIG-75-23
Contract N00014-70-A-0016-0001

Descriptors: *Silicon dioxide, *Chemical oceanography, Sea water, Volcanoes, Dissolving, Basalt, Sediments, Iron, Cobalt, Manganese, Laboratory tests.
Identifiers: Extrusive rocks, Rhyolite, Lavas.

The rate of silica dissolution from volcanic glass in seawater and NaCl solutions can be described by a combination of simultaneous first order reactions. Models that contain parabolic-rate diffusion processes did not agree with these data. Laboratory experiments studied the silica dissolution rate from one rhyolitic and two basaltic glasses in the pH range of 7.3 to 8.3 and at temperatures of 25, 60, and 90 C. The early flux of silica from these samples was greatest for the basaltic reticulite pumice, less for the basaltic hyaloclastite glass, and least for the rhyolitic obsidian. Seawater collected adjacent to a basaltic lava flow as it entered the ocean was enriched in silica, iron, and manganese; but cobalt, copper, nickel, lead, chromium, and zinc concentrations were not significantly different from the control samples.

E76-10414 PC$6.00/MF$3.00
Geological Survey, San Juan, Puerto Rico.
The Utility of Skylab Photo-Interpreted Earth Resources Data in Studies of Marine Geology and Coastal Processes in Puerto Rico and the Virgin Islands.
Final rept. 31 May 73-15 Oct 75,
James V. A. Trumbull. 15 Oct 75, 141p NASA-CR-147437
NASA Order T-4658-B
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Geology, *Ocean bottom, Coasts, *Puerto Rico, *Virgin Islands, Erosion, Sediments, Pattern recognition, EREP, Skylab program, Photointerpretation, Image enhancement, Multispectral photography.
Identifiers: Bathymetry, Turbidity, Oil pollution, Sediments, Sediment transport, Water erosion, *Coastal topographic features.

The author has identified the following significant results. Three Skylab earth resources passes over Puerto Rico and St. Croix on 6 June and 30 November 1973 and 18 January 1974 resulted in color photography and multispectral photography and scanner imagery. Bathymetric and turbid water features are differentiable by use of the multispectral data. Photography allows mapping of coral reefs, offshore sand deposits, areas of coastal erosion, and patterns of sediment transport. Bottom sediment types could not be differentiated. Patterns of bottom dwelling biologic communities are well protrayed but are difficult to differentiate from bathymetric detail. Effluent discharges and oil slicks are readily detected and are differentiated from other phenomena by the persistence of their images into the longer wavelength multispectral bands.

N76-25637/9GA PC$4.00/MF$3.00
Marine Environmental Sciences Consortium, Dauphin Island, Ala.
Mobile Bay Turbidity Plume Study.
Report, 1 Apr. 1975 - 31 Mar. 1976.
G. F. Crozier. 14 Apr 76, 44p NASA-CR-144331
Contract NAS8-30810

Descriptors: *Remote sensors, *Sea water, *Sediment transport, *Transmissometers, Alabama, Bays (Topographic features), Gulf of Mexico, Turbidity, Water currents.
Identifiers: *Mobile Bay.

For abstract, see STAR 1416

8K. Seismology

AD-A027 179/1GA PC$3.50/MF$3.00
Ensco Inc Springfield Va
Improved Procedures for Determining Seismic Source Depths from Depth Phase Information.
Quarterly rept. 1 Dec 75-29 Feb 76,
Edward Page. Feb 76, 17p
Contract F08606-76-C-0003, ARPA Order-2551

Descriptors: *Seismic waves, *Seismic detection, Depth finding, Range(Distance), Automation, Sources, Determination, Arrival, Time, Methodology.

Seismic source depth determination techniques, developed under two previous contracts, were formulated into an automated analysis procedure. Differential travel time information, for several propagation modes relevant to the analysis, have been made accessible through 3 D curve fitting. (Author)

AD-A027 198/1GA PC$3.50/MF$3.00
Air Force Geophysics Lab Hanscom AFB Mass
On Motion Environments.
Final rept.,
F. A. Crowley, and H. A. Ossing. 15 Jul 76, 10p
Rept no. AFGL-TR-76-0153

Descriptors: *Ground motion, *Seismic waves, Environments, Seismological stations, Test facilities, Guided missile silos, Surface to surface missiles, Suspension devices, Earthquakes, Microseisms, Alignment, Rotation, Motion, Mathematical analysis.

The motion environment of the seismic observatory, the inertial hardware test facility and the siloed missile differ in important aspects. For the observatory, motion is the resultant of a large number of independent sources colored by transmission through the earth and observed in the far field. The test facility reflects the near field contributions of a modest number of seismic sources, while the siloed missile's motion can be quite unrelated to ground inputs. Our study considers a number of motion attributes of significance to inertial hardware performance for these three environments both for a quiescent state and following earthquakes. (Author)

AD-A027 713/7GA PC$4.00/MF$3.00
Lamont-Doherty Geological Observatory Palisades N Y
Theory and Calculation for the Displacements and Stresses at an Earthquake source.
Final rept. 1 Oct 73-31 Mar 76,
Paul G. Richards. 1 Jun 76, 50p AFOSR-TR-76-0833
Contract F44620-74-C-0029, ARPA Order-1827

Descriptors: *Earthquakes, *Epicenters, *Ground motion, Faults(Geology), Dislocations, Displacement, Green's function, Wave propagation.
Identifiers: Accelerograms.

Contents: First strong motion records from a Central or Eastern United States earthquake; Source properties of a Blue Mountain Lake earthquake; Comparison of strong ground motion from several dislocation models; The dynamic field of a growing plane elliptical shear crack; Motions near a shallow rupturing fault: evaluation of effects due to the free surface; and List of publications.

PB-255 386/0GA PC$13.00/MF$3.00
United States-Israel Binational Science Foundation.
Seismic Zoning of the USSR.
1976, 536p TT-75-50003, ISBN-0-7065-1533-1
Trans. of mono. Mezhduvedomstvennyi Sovet po Seismologii i Seismostoikomu Stroitelstvu, Moscow, 1968, by Rita Teteruk-Schneider. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Seismology, *USSR, *Books, Tectonics, Geology, Geography, Earthquakes, Translations.

This book presents the results of seismological, engineering-seismological and geological studies which were carried out in order to provide a basis for seismic zoning. A new, much-improved, greatly revised seismic-zoning map of the USSR is also included. The map shows areas where vibrations are possible under average ground conditions during earthquakes with intensities of 10, 9, 8, 7, and 6. Predictions of the seismic effects on structures are also given. Copyright (c) 1976 Keter Publishing House Jerusalem Ltd.

8M. Soil Mechanics

AD-A027 432/4GA PC$4.00/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
Centrifuge Model Testing of Soils: A Literature Review.
Final rept. Sep 74-Dec 74,
Mosaid M. Al-Hussaini. Jun 76, 45p Rept no. WES-MP-S-76-9
Includes Errata Sheet No. 1 dated 21 Jul 76.

Descriptors: *Soil mechanics, *Centrifuges, Test facilities, Laboratory tests, Experimental data, Physical properties, Military engineering, Foundations(Structures), Model tests, Feasibility studies, Reviews.

Centrifugal model testing, pioneered by the U. S. Bureau of Mines, developed in the USSR, and advanced in both England and Japan, has been used to provide a realistic approach for solving complex soil mechanics problems. The basic concept of this testing technique is to create a scale model similar in every respect to a prototype and to subject the model to an acceleration such that the increase in self-weight stresses is equivalent to those at corresponding points in the prototype. With this method, the investigator can observe, in a short period of time, a sequence of events that is analogous to that occurring in the prototype over a long period of time. Published work concerning the theoretical and practical application of the centrifugal model testing was reviewed and documented. Various devices and techniques used in centrifuge model testing were studied. The feasibility of a centrifugal testing facility at the U. S. Army Engineer Waterways Experiment Station (WES) was examined. Major advantages and limitations of the modelling technique were also discussed in this study. Based on the review of literature and the large number of centrifugal testing facilities being used around the world, soil modelling using the centrifuge is technically attractive and appears to have great potential for solving geotechnical problems that cannot be solved adequately by conventional means. WES offers an ideal environment for the establishment of such a facility. (Author)

E76-10413 PC$5.00/MF$3.00
South Dakota State Univ., Brookings. Remote Sensing Inst.
Soil Moisture and Evapotranspiration Predictions Using Skylab Data.
Final rept. 1 Mar 73-30 Sep 75,
V. I. Myers, D. G. Moore, M. L. Horton, and M. J. Russell. Sep 75, 97p SDSU-RSI-75-09, NASA-CR-147441
Contract NAS9-13337
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: *Soil moisture, *Evapotranspiration, *Texas, Irrigation, Land use agriculture, EREP, Skylab program, Multispectral band scanners, Reflectance.
Identifiers: Soil water.

The author has identified the following significant results. Multispectral reflectance and emittance data from the Skylab workshop were evaluated for prediction of evapotranspiration and soil moisture for an irrigated region of southern Texas. Wavelengths greater than 2.1 micrometers were required to spectrally distinguish between wet and dry fallow surfaces. Thermal data provided a better estimate of soil moisture than did data from the reflective bands. Thermal data were dependent on soil moisture but not on the type of agricultural land use. The emittance map, when used in conjunction with existing models, did provide an estimate of evapotranspiration rates. Surveys of areas of high soil moisture can be accomplished with space altitude thermal data. Thermal data will provide a reliable input into irrigation scheduling.

N76-25636/1GA PC$3.50/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Remote Sensing of Soil Moisture.
T. Schmugge. Jun 76, 25p NASA-TM-X-71127, X-913-76-118
Conf-Presented at Symp. C., Cospar Meeting, Philadelphia, PA., 6 Jun. 1976.

Descriptors: *Moisture meters, *Remote sensors, *Soil moisture, Airborne equipment, Dielectric properties, Emissivity, Microwave sensors, Reflectance, Thermodynamic properties, Water.
Identifiers: Remote sensing.

For abstract, see STAR 1416

N76-25708/8GA PC$4.50/MF$3.00
Bittinger (M. W.) and Associates, Inc., Fort Collins, Colo.
Soil Moisture Ground Truth: Steamboat Springs, Colorado, Site and Walden, Colorado, Site.
Mission Report, 8-10 Mar. 1976.
E. B. Jones. Apr 76, 54p NASA-CR-144757
Contract NAS5-22312

Descriptors: Colorado, *Ground truth, *Soil moisture, Data bases, Nasa programs, Snow, Snow cover, Tables (Data).
Identifiers: Steamboat Springs(Colorado), Walden(Colorado).

For abstract, see STAR 1416

8N. Terrestrial Magnetism

PB-255 529/0GA Not available NTIS
National Oceanic and Atmospheric Administration, Miami, Fla. Atlantic Oceanographic and Meteorological Labs.
Magnetic Anomaly Sequence in the Central North Atlantic,
Robert K. Lattimore, Peter A. Rona, and Omar E. DeWald. 2 Apr 73, 4p NSF/IDOE-76-61
Pub. in Jnl. of Geophysical Research, v79 n8 p1207-1209, 10 Mar 74.

Descriptors: *Magnetic anomalies, *North Atlantic Ocean, Geomagnetism, Ocean bottom, Ocean basins, Tectonics, Abyssal zone, Cape Hatteras, Cape Blanc, Fracture zones.
Identifiers: Reprints, International Decade of Exploration.

Marine geophysical investigations in 1970 and 1971 have established the sequence of seafloor-spreading magnetic anomalies within the corridor extending from Cape Hatteras in North America to Cap Blanc in Africa. The standard 'Tertiary' anomalies out to 25 or 26 (64-66 m.y.B.P.) as well as the J and K anomalies can be recognized and correlated among the four traverses. Displacements of the anomalies suggest a complex fault pattern that may be associated with the Kane fracture zone. Copyright (c) 1974 by the American Geophysical Union.

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-A027 288/9GA PC$6.00/MF$3.00
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
Parameter Sensitivity Analysis of a High-Voltage, Vaporization-Cooled, Three-Phase, Core-Type Transformer.
Master's thesis,
Edgar L. Dove. Jun 76, 141p Rept no. GE/EE/76-8

Descriptors: *Transformers, *Magnetic cores, *Computer aided design, High voltage, High power, Vaporization, Cooling, Airborne, Power supplies, Parametric analysis, Computer programs, Theses.
Identifiers: Three phase transformers.

This parameter sensitivity analysis considers which independent design parameters have the most influence upon the determination of the weight and volume of a high-voltage, vaporization-cooled, three-phase, core-type transformer. The analysis is conducted through the use of a computer program which given a set of independent design parameters calculates a consistent set of values for the transformer's dependent design parameters. Two of the dependent design parameters are weight and volume. Initially, the weight and volume are determined for a reasonable set of independent design parameters. Then each independent design parameter is varied while all other independent parameters are held constant. With the weight and volume of th initial design as the common reference points, the comparison of the graphs of weight and volume as functions of the individually varied independent design parameters is the basis of the analysis. The analysis shows that the independent design parameters which most influence the deter-

mination of the weight and volume of the transformer are the power-out of the transformer, voltage-in, voltage-out, frequency of operation, number of inside secondary layers, maximum flux densities, conductor cooling rates, and the parameters which specify the core leg cross sectional areas. (Author)

AD-A027 268/2GA PC$3.50/MF$3.00
Purdue Univ Lafayette Ind
The Effects of Substrate Composition on Thick Film Circuit Reliability.
Quarterly technical rept. no. 1, 1 Feb-30 Apr 76,
R. W. Vest. 31 May 76, 20p
Contract N00019-76-C-0354

Descriptors: *Microcircuits, *Thick films, *Resistors, *Substrates, Electrical conductivity, Alumina, Ruthenium compounds, Dioxides, Glass, Electrical resistance, Adhesion, Chemical reactions, Microstructure, Impurities, Fabrication, Electrical conductivity.
Identifiers: Ruthenium oxides.

The print and fire processing of thick film circuits ensures that there will always be some degree of chemical interaction between the film and the substrate, because all common substrate materials are soluble to some degree in the glass used in thick film inks. This interaction is primarily responsible for the development of adhesion between the thick film resistor and the substrate. By virtue of the resistor-substrate interaction, the composition of the glass is changed, and as a consequence all of the physical properties of the glass will change to some extent. This research program is directed toward the determination of the effects of the major constituent, common additives, and impurities in alumina substrates on the kinetics of microstructure development, electrical characteristics and the adhesion of thick film resistors.

AD-A027 301/1GA PC$3.50/MF$3.00
Usce/Centralab Los Angeles Calif
Manufacturing Methods and Technology Project to Establish and Improve the Producibility of Silk Screening and Layering of Ceramic Dielectric Capacitors.
Quarterly progress rept. no. 3, 1 Jan-1 Apr 76,
Howard U. Taylor. 1 Apr 76, 17p Rept no. 76-05-03
Contract DAAB07-75-C-0041

Descriptors: *Ceramic capacitors, *Dielectric films, Chips(Electronics), Palladium, Cost benefits, Manufacturing, Technology, Production engineering.

A summary manufacturing methods and technology engineering for silk screening and layering three dielectric capacitor types is presented. Chip capacitors to be manufactured using .0005 inch dielectric rated at 50 volts at a pre-dunction rate of 5000 units per day. Internal electrodes shall be of a basemetal or alloy that will provide for an objective of 80% cost reduction from the use of palladuim. End terminations shall be of the same material and must be capable of immersion for seconds at 500F in 60/40 solder.

AD-A027 385/7GA PC$3.50/MF$3.00
Rome Air Development Center Griffiss AFB N Y
Acoustic Loss and Frequency Offset Measurements on 5 MHz Quartz Resonators.
Rept. for Sep 74-Apr 76,
Richard N. Brown. May 76, 24p Rept no. RADC-TR-76-164

Descriptors: *Quartz resonators, *Acoustic attenuation, High frequency, Acoustics, Losses, Potassium, Lithium, Doping, Crystal growth, Synthetic materials.
Identifiers: Acoustic loss, Frequency offset measurements, Swept electronic grade.

Acoustic loss and frequency offset measurements are reported for several types of synthetic quartz resonators operating at 5 MHz in an attempt to answer several questions concerning the failure of swept electronic grade quartz to be radiation resistant. The loss was recorded from the temperature of liquid helium to 400K. The offset of the resonant frequency with electron irradiation was measured up to a dose of 1 MRad. Irradiations were performed, for the most part, with the resonator in an oven at 55C, but one resonator was irradiated in a dewar at 17K. The results indicate the swept electronic grade resonators of recent manufacture are radiation resistant. (Author)

AD-A027 398/7GA PC$8.00/MF$3.00
Dayton Univ Ohio Dept of Electrical Engineering
Physical Properties of Rare Earth-Cobalt Magnets (Alternator Service Aging Study).
Final rept. 1 Apr 74-30 Jun 75,
Herbert F. Mildrum, and Karl J. Strnat. Dec 75,
236p UDRI-TR-75, AFML-TR-75-190
Contract F33615-74-C-5056

Descriptors: *Permanent magnets, *Alternators, Permanent magnet generators, Cobalt alloys, Samarium intermetallics, Rare earth alloys, Magnetic properties, Physical properties, Accelerated testing, Stability, Life tests, Aircraft equipment, Aging(Materials).

The principal objective of this program was to investigate the long-term performance stability of an aircraft alternator, under conditions simulating its operation in flight. This alternator uses sintered Sm-Co permanent magnets in its rotor. As these are known to degrade with time at elevated temperature, and it was feared that magnetic flux losses or the physical disintegration of the magnets might cause the generator to fail, changes in the machine performance were correlated to the aging of the magnets in the rotor and in separate, static tests. The report describes the design of a test stand for subjecting the machine to cyclic operation at speeds up to 11000 rpm and thermal exposure in air up to 215C. Methods and special instrumentation for measuring the electric output of all the windings, the magnetic state of the individual magnets, and the average flux of each of the three magnet stacks are described.

AD-A027 442/3GA PC$4.50/MF$3.00
Westinghouse Electric Corp Pittsburgh Pa Research and Development Center
Gallium Arsenide Vertical Channel Insulated Gate Field-Effect Transistor.
Annual rept. Jan-Dec 75,
M. C. Driver, D. A. Tremere, and T. M. S. Heng.
18 Jun 76, 56p Rept no. 76-9G7-VMIST-R1
Contract N00014-75-C-0418

Descriptors: *Field effect transistors, *Gallium arsenides, Channels, Vertical orientation, Insulation, Gates(Circuits), Diffusion, Ion implantation.
Identifiers: *Insulated gate field effect transistors.

Basic studies of the various technologies relevant to the development of a power microwave vertical channel gallium arsenide insulated gate field-effect transistor have been carried out. The results indicate that while some technologies are in hand, a number of problems still exist in the areas of insulator stability and the $n(+)$-p-$n(-)$-$n(+)$ profile formation. (Author)

AD-A027 561/8GA PC$8.00/MF$3.00
Aerojet Electrosystems Co Azusa Calif
Thin Film Transistor Improvement Investigation.
Final rept. 1 May 75-29 Feb 76,
K. O. Fugate. Apr 76, 226p AESC-5286, ONR-CR213-133-1F
Contract N00014-75-C-1137

Descriptors: *Transistors, *Thin films, Flat pack circuits, Panels, Matrix displays, Lead sulfides, Cadmium selenides, Charge transfer, Shift registers, Analog systems, Digital systems.
Identifiers: *Thin film transistors, Bucket brigrade devices, Serial to parallel conversion.

This program was undertaken to develop thin film transistor (TFT) flat panel display peripheral addressing circuitry amenable to display substrate integration. It included investigation of means to improve the gain and frequency response of thin film transistors for attainment of the foregoing objective. The major achievement of the program evolved during investigation of candidate peripheral addressing circuit configurations. Analytical studies indicated that the thin film bucket brigade device (BBD), developed for sensor applications on a prior program, might offer significant advantages of peripheral addressing when configured for the requisite serial to parallel function. This discovery came late in the program, permitting only one trial design. Results indicated the potential was indeed there, but attainment of greater charge transfer efficiency would be mandatory. The investigation for improvement of thin film transistors included (1) optimization of deposition and annealing parameters, (2) evaluation of new dielectric materials, and (3) techniques for reduction of device geometry. Initial effort concentrated on thin film transistors incorporating lead sulfide (PbS) as the semiconductor material.

AD-A027 529/9GA PC$3.50/MF$3.00
Naval Research Lab Washington D C
Investigations of Dielectric-Rod Focusing for Traveling-Wave Tubes.
Final rept.,
S. T. Smith, and J. T. Jensen, Jr. Jun 76, 25p
Rept no. NRL-MR-3311

Descriptors: *Traveling wave tubes, *Focusing, Dielectrics, Rods, Electron emission, Electrostatics, Space charge, Pinch effect, Field emission, Electron beams, Military applications.

Relativistic electron-beam experiments by others have shown that thousands of amperes of field-emission beam current can be strongly contained and guided along the surface of a dielectric rod in vacuum. The report describes experiments to adapt this method to one-ampere, 8 to 15 kV electron beams to be used in military applications of traveling-wave tubes. Results indicate that a plasma flare forms along the dielectric rod due to field emission induced breakdown. Electron emission occurs from the plasma at the end of the rod due to lateral conductivity of the plasma surrounding the dielectric rod. The dielectric rod acts as an extension of the cathode. This proposed explanation rules out the use of a dielectric rod as a focusing device within the microwave circuit, but the dielectric rod could possibly be useful for forming and guiding the beam to the entrance of the circuit. A titanium film electrode was used as a low-voltage trigger mechanism to initiate the plasma discharge. Such a trigger device can be used to eliminate a high-voltage high-power modulator and also to achieve consistent triggering from pulse to pulse.

AD-A027 534/7GA PC$4.00/MF$3.00
Electronic Systems Div Hanscom AFB Mass
Some Mathematical Considerations Regarding the Calculation of Permanent Damage of Devices Due to EMP Pulses.
Technical rept.,
Ira Kohlberg. Jul 76, 37p Rept no. ESD-TR-76-187

Descriptors: *Junction diodes, *Semiconductor junctions, *Transient radiation effects, Electromagnetic pulses, Mathematical analysis.

A mathematical analysis of the failure of semiconductor junctions due to EMP induced pulses is presented. Included in this discussion are: the effects of finite-size p-n junctions on maximum temperature buildup; an evaluation of interpulse cooling; and a determination of the response of these devices to damped periodic waveforms. Limitations of the results are presented. Such information will be generally useful for performing preliminary damage assessment and/or screening of devices.

AD-A027 558/8GA MF$3.00
Army Electronics Command Fort Monmouth N J
KWIC Index of Technical Papers, International Wire and Cable Symposia (1952-1975).
Technical rept.,
Elmer F. Godwin. May 76, 107p Rept no. ECOM-4414
Availability: Microfiche copies only.

Descriptors: *Indexes, *Electric cables, *Electric wire, *Electronic equipment, *Reports, *Communication equipment, *Symposia, Telephone systems, Avionics, Test methods, Performance tests, Test and evaluation.
Identifiers: *KWIC index, KWIC(Key word in context), *Key word in content, Military electronics, Aerospace electronics, Design, Technical papers, International symposia.

This bibliography lists 685 technical papers presented at International Wire and Gable Symposia from 1952 through 1975. The citations are grouped by symposium number and two indexes are provided: a Key Word in Context (KWIC) index for retrieval of titles by subject, and an author index. Among the broad subject areas covered in the bibliography are: military and aerospace electronics; telephone communications; electronic wiring; cable design, test and performance; evaluation; and related fields of chemistry and electrical engineering. (Author)

AD-A027 595/8GA PC$5.00/MF$3.00
Intelcom Rad Tech San Diego Calif
Cable Response Solution Techniques for the System-Generated Electromagnetic Pulse Environment. Volume I. Methodology and Development of a System Generated Electromagnetic Pulse Cable Code.
Final rept.,
Eric P. Wenaas, and Roland E. Leadon. May 76, 92p INTEL-RT-8111-078-Vol-1, AFWL-TR-75-174-Vol-1
Contract F29601-74-C-0039
See also Volume 2, AD-A026 897.

Descriptors: *Electromagnetic pulses, Military satellites, *Electric cables, *Cable assemblies, Radiation hardening, Computerized simulation, Response, Coupling(Interaction), X rays, Gamma rays, Electric current.
Identifiers: SGEMP(System generated electromagnetic pulse), System generated electromagnetic pulse, Pulse response.

Solution techniques for the System Generated Electromagnetic Pulse (SGEMP) excitation of single- and multiple-wire cables are explored, and a formalism for solving the cable problem is defined. Progress on the development of a computer code for predicting these currents is reported. (Author)

AD-A027 886/8GA PC$4.00/MF$3.00
Harry Diamond Labs Adelphi Md
A Rugged Microwave Acoustic Delay Line with Integral Matching.
Technical rept.,
Stuart I. Lieberman. Feb 76, 30p Rept no. HDL-TR-1738

Descriptors: *Acoustic delay lines, *Microwave equipment, Single crystals, Quartz, Sapphire, Electroacoustic transducers, Equivalent circuits, Packaging.
Identifiers: Bulkwave delay lines, Integral matching.

The characteristics are shown for a rugged, integrally matched bulk delay line that incorporates the entire transducer and matching structure on the end surfaces of the delay line rod. The significant elements in designing a bulk delay line for a specific application are discussed, along with pertinent fabrication techniques. The integrated matching structure produces a 10-percent bandwidth with a VSWR less than 3:1. (Author)

AD-A027 751/7GA PC$3.50/MF$3.00
Massachusetts Inst of Tech Cambridge Dept of Electrical Engineering
Silicon Doped Gallium Arsenide Antimonide Electroluminescent Diodes Emitting to 1.06 Micrometers,
S. K. Brierley, and C. G. Fonstad. 17 Feb 75, 4p AFOSR-TR-76-0785
Grant AF-AFOSR-2493-73
Availability: Pub. in Jnl. of Applied Physics, v46 n8 p3678-3680 Aug 75.

Descriptors: *Light emitting diodes, Electroluminescence, Infrared radiation, Fiber optics, Silicon, Doping, Liquid Phases, Epitaxial Growth, Gallium Arsenides, Gallium antimonides, Reprints.
Identifiers: *Electroluminescent diodes.

This study reports efficient room temperature emission to 1.06 micrometers from silicon-doped gallium arsenide antimonide electroluminescent diodes fabricated in GaAs(sub 1-x)Sb sub x layers grown on GaAs substrates in a single-step LPE growth from melts containing from 0.1 to 1.1 at .% Si. The spectral half-width of the emission is 42.5 nm at 0.96 micrometers and 79 nm at 1.06 micrometers.

N76-25867/8GA Not available NTIS
Kernforschungszentrum, Karlsruhe (West Germany). Inst. fuer Experimentelle Kernphysik.
Superconducting Switch with Impulse Current Triggering.
H. Koefler. Aug 75, 24p KFK-2123
In German; English Summary.

Descriptors: *Actuators, *Superconductors, *Switches, Capacitors, Energy storage, Trigger circuits.
Identifiers: West Germany.

For abstract, see STAR 1416

PAT-APPL-673 338/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Method for Making Beam Leads for Ceramic Substrates.
Patent Application,
Frank A. Lindberg. Filed 2 Apr 76, 9p AD-D002 599/9
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Circuit interconnections, Electric connectors, Microelectronics, Substrates, Integrated circuits, Microcircuits, Ultrasonic welding.
Identifiers: *Beam lead devices, *Patent applications, PAT-CL-174-88.5.

The patent application describes a method for making beam leads for use in the interconnecting of electronic devices and packages. A first metal is deposited onto a substrate which has poor adhesion with the substrate. A portion of the deposited metal is then etched away leaving on said substrate deposited metal at locations where a second metal is not to adhere to the substrate. Then depositing onto said substrate and over said first deposited metal a plurality of beam leads of a second metal. Then lifting said portions of said first metal from said substrate and then etching away said first metal to provide beam leads partially attached to said substrate.

PAT-APPL-679 267/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
Supersonic Spark Gap Switch.
Patent Application,
Douglas C. Rabe. Filed 22 Apr 76, 14p AD-D002 626/0
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Spark gaps, Supersonic flow, Electrodes, Supersonic nozzles, Electric switches.
Identifiers: *Patent applications, Clearing, PAT-CL-333-13.

The patent application relates to hot gases and discharge products removed from the space between the electrodes of a spark gap switch after the passage of the discharge by a supersonic air flow in the discharge region created by fabricating the ends of the electrodes to form a DeLaval nozzle. The supersonic air flow clears the switch and provides a switch having a very short grace period.

PAT-APPL-679 268/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
Acoustic Surface Wave Bubble Switch.
Patent Application,
Wayne C. Hubbell. Filed 22 Apr 76, 12p AD-D002 627/8
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Switching circuits, *Magnetic domains, Acoustic waves, Surface waves, Switches, Logic circuits.
Identifiers: *Magnetic bubble domains, *Patent applications, PAT-CL-340-174, Acoustic surface waves.

The patent application relates to an acoustic surface wave bubble switch in which a magnetic bubble domain traveling in a thin film magnetic platelet can be guided in alternate directions by application of an acoustic wave. An array of longitudinal magnetic elements in the form of single bars and bars combined to form a T configuration together with a rotating in-plane magnetic field causes the magnetic bubble to propagate across the magnetic platelet. One of the configurations of the magnetic element is a T with a second horizontal bar and the bubble will have equal attraction for either of the horizontal bars. At the proper time an acoustic wave can direct the bubble to propagate in the direction of a chosen horizontal bar thereby effecting a switching action.

PATENT-3 937 979 Not available NTIS
Department of the Navy Washington D C
Photoparametric Amplifying Upconverter.
Patent,
Michael K. Giles, and Walter E. Freitag. Filed 7 Dec 73, patented 10 Feb 76, 4p AD-D002 659/1, PAT-APPL-422 810
Supersedes AD-D000 516.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Parametric amplifiers, *Patents, Photodiodes, Silicon, Indium antimonides, Light, Semiconductor junctions.

Identifiers: PAT-CL-307-88.3, *Photoparametric amplifiers, Infrared upconversion.

The present invention comprises a low frequency photoparametric amplifying upconverter which uses a pumping source, isolating and clamping capacitor, InSb or Si photodiode and load resistance, all connected in series. The input for the photoparametric amplifying upconverter is the junction current generated by illumination of the photodiode. Thus, the photoparametric amplifying upconverter is simply a p-n junction that is illuminated to act as a photodiode and pumped so that it operates as a photoparametric amplifying upconverter.

9B. Computers

AD-A027 163/5GA PC$4.00/MF$3.00
Command and Control Technical Center Washington D C
A Comparison of Two Languages for Describing Stored Data,
Ed Birss, and James P. Fry. 1975, 48p

Descriptors: *Data bases, Linguistics, Computer logic, Machine translation, *Data storage systems, Validation, Information processing, *Programming languages.
Identifiers: *Stored data definition languages, SDDL(Stored data definition languages), Computer software, *Codasyl programming language, Data definition, Data restructuring, Data translation.

Stored-Data Definition Languages have been developed to describe both the logical and the physical characteristics of stored-data. Two efforts, the Stored-Data Definition and Translation Task Group (SDDTTG) of the CODASYL Systems Committee and the Data Translation Project (DTP) at The University of Michigan, have produced Stored-Data Definition Languages. Although the translation methodologies are similar, the languages have different characteristics being influenced by their underlying models of data, reorganization, and translation capabilities. The language specified by SDDTTG (SDDL) has three main sections which describe the logical structure, the physical structure, and the correspondence between the two. The SDDL descriptions are based on the DIAM String model and, therefore are very adept at describing access paths. The SDDL also allows specification of validation information -- checks that are performed on data instances during the translation process. Thus, the SDDL is reformatting oriented, low level, precise, and a rather complete language.

AD-A027 175/9GA PC$4.50/MF$3.00
Dayton Univ Ohio Research Inst
Three Dimensional Display of the COMBIMAN Man-Model and Work Space.
Final rept.,
Frank J. Bates, Jr., Susan M. Evans, Horst E. Krause, and Henry Luming. Jul 76, 56p UDRI-TR-73-47, AMRL-TR-74-15
Contract F33615-71-C-1113

Descriptors: *Computer aided design, *Computer graphics, *Man machine systems, *Workplace layout, Biomechanics, Three dimensional, Human body, Mathematical models, Anatomical models, Optimization, Human factors engineering, Euler angles, Geometry, Positioning reactions, Operators(Personnel), Attitude(inclination), Mathematical prediction, Computer programs, Flow charting, Subroutines.
Identifiers: *COMBIMAN computer program, Reach.

This report describes the status of the COMputerized Biomechanical MAN-model, COMBIMAN, as of Oct 73. It deals with the theoretical development of the concepts of the COMBIMAN model, and their application. COMBIMAN is a 3-D computer graphic manikin used for the design and evaluation of workplaces. The report explains the modelling technique used in constructing the man-model. Equations were derived which allow the user to compute the coordinates of points on the model in a specified body position. These equations form the core of the COMBIMAN computer programs. The report also describes the theoretical background and techniques for the prediction of human attitudes in specified task/or environmental conditions. Using the described techniques for constructing and positioning the model, the report also deals with predicting the reach capabilities of a human operator.

AD-A027 208/5GA PC$4.00/MF$3.00
Southern Methodist Univ Dallas Tex Dept of Industrial Engineering and Operations Research
An Evaluation of CPU Efficiency under Dynamic Quantum Allocation,
U. Narayan Bhat, and Richard E. Nance. Oct 75, 27p Rept no. IEOR-75012
Contract N00014-75-C-0517
Prepared in cooperation with Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Computer Science.

Descriptors: *Central processing units, Time sharing, Computer programming, Scheduling, Allocations.
Identifiers: Operating systems(Computers), Computer storage management, Computer performance evaluation.

A model for a time-sharing operating system is developed in order to assess the effects of dynamic quantum allocation and overhead variability on central processing unit (CPU) efficiency. CPU efficiency is determined by the proportion of time devoted to user-oriented (problem state) tasks within a busy period. Computational results indicate that a dynamic quantum allocation strategy produces significant differences in CPU efficiency compared to a constant quantum. Strategies that increase the quantum with increasing load effect lower CPU efficiency; while strategies using decreasing quantum produce mixed results. Overhead variability also causes a pronounced effect. A conjecture is stated that relates the average quantum length to the effect on CPU efficiency under a fixed strategy 'variability'.

AD-A027 230/2GA PC$4.50/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md
COMRADE Data Management System Primer.
Research and development rept.,
Roger J. Martin, and Camille P. Bell. Jan 76, 74p Rept no. DTNSRDC-76-0005

Descriptors: *Computer aided design, *Data management, Ships, Naval vessels, Data bases, Data storage systems, Computer programs, Digital computers, Fortran, Data processing.
Identifiers: *COMRADE system, *Data base management systems, CDC-6700 computers.

This report is a primer to the COMRADE (COMputer Aided Design Environment) Data Management System (CDMS). It explains how to use CDMS by discussing the steps which were followed in creating, using, and updating a sample data base. At each step the available CDMS facilities are discussed and a description of how to use them is presented. CDMS is currently operable on the David W. Taylor Naval Ship Research and Development Center CDC 6700 computing facility under the SCOPE 3.4 operating system. (Author)

AD-A027 251/8GA PC$5.00/MF$3.00
Naval Postgraduate School Monterey Calif
The Development of a Partitioned Segmented Memory Manager for the UNIX Operating System.
Master's thesis,
Harvey William Emery, Jr. Jun 76, 91p

Descriptors: *Memory devices, *Minicomputers, Computer graphics, Signal processing, Paging, Segmented, Subroutines, Input output models, Theses.
Identifiers: UNIX operating system, PDP-11 computers, Partitioning, Operating systems(Computers), *Computer storage management.

This thesis reports the results of an investigation of the applicability of paging and segmentation to memory management in modified UNIX operating systems on the PDP-11/50 minicomputer system at the Naval Postgraduate School Signal Processing and Display Laboratory. Two memory managers are specifically considered: a partitioned segmented memory manager that was designed and implemented; and a simpler, segmented memory manager that was designed based on the performance of the partitioned segmented memory manager. Recommendations are given for future work. (Author)

AD-A027 254/2GA PC$5.00/MF$3.00
Naval Postgraduate School Monterey Calif
Design Manual for the Vector General Graphics Display Unit.
Technical rept.,
Lloyd A. Thorpe, and Gary M. Raetz. 15 Mar 76, 80p Rept no. NPS-72Rr76032

Descriptors: *Interactive graphics, *Computer programs, *Programming languages, Real time, Time sharing, Subroutines, Interfaces, Interruption, Light pens, Memory devices, Drives(Electronics).
Identifiers: C Programming language, Multiprogramming, PDP-11/50 computers, Vector general graphics display unit.

This report describes the program description of an interactive graphics package interfacing the Vector General Graphics Display Unit and a Digital Equipment Corporation PDP-11/50 computer. The program was written in the C-programming language and designed to be used in the multiprogramming environment of the UNIX Timesharing operating system. Included is a description of the Vector General, operating system modifications, device driver, and interface routines. (Author)

AD-A027 270/8GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Overview of Software Acquisition for Army Tactical Data Systems.
Study project rept.,
Thomas J. Robinson. Nov 75, 46p
Report on Program Management Course.

Descriptors: *Army procurement, *Management, *Tactical data systems, Computer applications, Contract administration, Data processing.
Identifiers: *Computer software, AN/GSG-10, AN/TSQ-73.

The evolution of the AN/GSG-10 Tactical Fire Direction System (TACFIRE), AN/TSQ-73 Air Defense Command and Control System (Missile Minder) and the Tactical Operations System (TOS) is presented. Also, some observations/lessons learned during the development of each system are presented. A review of all Department of Defense publications governing software acquisition was not possible within the time available for the study. Therefore, the study effort was limited to identifying the current publications (i.e., regulations, pamphlets and military standards) that define the software acquisition process for Army tactical data systems. In most cases, the available publications pertain only to hardware and do not address software. The hardware principles of con-

figuration management that are being tailored and refined to provide a means for the management of every detail of a software project are discussed.

AD-A027 278/1GA PC$3.50/MF$3.00
Illinois Univ At Urbana-Champaign Coordinated Science Lab
Optimal NOR Networks for Self-Dual Functions of Four Variables.
Technical rept.,
D. Reynolds, and G. Metze. May 76, 23p Rept nos. R-729, UILU-ENG-76-2217
Contract DAAB07-72-C-0259

Descriptors: *Logic circuits, Gates(Circuits), Boolean algebra, Algorithms, FORTRAN.
Identifiers: *Network synthesis, *Logic design.

A complete catalog of optimal NOR realizations for all self-dual functions of four or fewer variables is presented, where optimality is achieved by first minimizing the number of gates required, then minimizing the number of gates inputs required, and finally, minimizing the number of logic levels required to realize the function. Complements of input variables are assumed to be unavailable.

AD-A027 306/6GA PC$3.50/MF$3.00
Princeton Univ N J Dept of Electrical Engineering
A New Hardware Realization of High-Speed Fast Fourier Transformers,
Bede Liu, and Abraham Peled. 6 Mar 74, 7p
AFOSR-TR-76-0583
Grants AF-AFOSR-2101-71, NSF-GK-24187
AvAilability: Pub. in IEEE Transactions on Acoustics, Speech, and Signal Processing, vaSSP-23 n6 p543-547 Dec 75.

Descriptors: *Fast Fourier transforms, Data processing, Memory devices, Signal processing, Algorithms, Reprints.

A new approach to the hardware implementation of high-speed processors dedicated to perform the fast Fourier transform (FFT) in real time is presented. This approach capitalizes on recent advances in semiconductor memory technology to eliminate conventional multipliers, and is shown to offer significant reductions in hardware complexity and power consumption. It also yields a highly modular hardware configuration. A modified floating-point arithmetic is incorporated to allow a wider dynamic range. Using standard available TTL integrated circuits, a throughput of complex data points at a 25 MHz word rate is possible. (Author)

AD-A027 313/6GA PC$3.50/MF$3.00
Maryland Univ College Park Computer Science Center
Detection of Step Edges in Noisy One-Dimensional Data,
Larry S. Davis, and Azriel Rosenfeld. 24 Jun 74, 6p AFOSR-TR-76-0229
Contract F44620-72-C-0062
Availability: Pub. in IEEE Transactions on Computers, p1008-1010 Oct 75.

Descriptors: *Image processing, Edges, Detectors, *Scene analysis, Data processing, Gray scale, Sizes(Dimensions), Pictures, Reprints.
Identifiers: *Edge detection, One dimensional.

A method of detecting step edges in noisy one-dimensional input data is described. The method involves examination of differences in average gray level over ranges of positions and sizes. Unlike previously described methods, it remains reliable when edges occur close to one another. (Author)

AD-A027 326/8GA PC$3.50/MF$3.00
Northwestern Univ Evanston Ill Dept of Electrical Engineering
On Models for Diagnosable Systems and Probabilistic Fault Diagnosis,
Shachindra N. Maheshwari, and S. Louis Hakimi. 16 Jul 74, 11p AFOSR-TR-76-0709
Grant AF-AFOSR-2103-71
Availability: Pub. in IEEE Transactions on Computers, vC-25 n3 p228-236 Mar 76.

Descriptors: *Fault tolerant computing, *Diagnosis(General), Digital systems, Errors, Automatic, Graphs, Models, Probability, Reprints.
Identifiers: Self repair.

This paper is concerned with automatic fault diagnosis for digital systems with multiple faults. Three problems are treated: (1) Probabilistic fault diagnosis is presented using the graph-theoretic model of Preparata et al. The necessary and sufficient conditions to correctly diagnose any fault set whose probability of occurrence is greater than t have been developed. Some simple sufficient conditions are also discussed. (2) A general model that contains as special cases both the graph-theoretic and the Russell-Kime models is developed. Conditions for T-fault diagnosability are given, thus settling some open problems introduced by Russell and Kime. (3) Finally, sequential T-fault diagnosability is considered. Existence of a class of systems requiring as little as n + T - 1 tests is shown. This improves significantly upon the previously best known class of systems that required n + 2T - 2 tests for sequential T-fault diagnosability. (Author)

AD-A027 352/4GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Development of Weapon Systems Computer Programs, Guidelines for Controlling During FSD.
Student project rept.,
Ronald J. Zabriskie. Nov 75, 57p

Descriptors: *Computer program documentation, *Computer programs, *Weapon systems, Full scale systems, Management planning and control, Life cycle costs, Digital computers, Interfaces, Flow charting, Quality assurance, Computer logic.
Identifiers: *Computer software, Program management, Guidelines, Milestones.

Weapon system costs have sharply increased in the last decade. One of the major factors for this increase is that most of the systems are digital in operation. But, it is not the costs of the computers that have been driving the costs upward; it is the cost of the associated computer programs. Much has been said about controlling the costs of these computer programs from development through the life cycle of the system. However, there are neither directives nor guidelines to assist in attempting to control. Even a general WBS for the development of computer programs is non-existent. This study paper is an attempt in establishing some guidelines for controlling the development of computer programs during full scale development which would reduce risks and overall life cycle costs. (Author)

AD-A027 353/2GA MF$3.00
Naval Postgraduate School Monterey Calif
Users Manual for the Vector General Graphics Display Unit.
Technical rept.,
Lloyd A. Thorpe, and Gary M. Raetz. 15 Mar 76, 88p Rept no. NPS-72Rr76031
Availability: Microfiche copies only.

Descriptors: *Interactive graphics, Instruction manuals, *Computer programs, Digital computers, Programming languages, Man machine systems, Real time, Computer graphics, Control systems, Television display systems, Light pens, Computer aided instruction, Cathode ray tubes.
Identifiers: Vector General Graphics Display Unit, PDP-11/50 computers, C Programming language.

This report is the description of a users manual for an interactive graphics package designed to allow programmatic control of the Vector General Graphics Display Unit from a Digital Equipment Corporation PDP-11/50 computer. The manual requires a knowledge of the C-programming language and a general familiarity with graphics terminology. Included is a brief description of the Vector General Graphics Display Unit, a description of the interface routines, and a description of the Vector General graphics display instructions. (Author)

AD-A027 360/7GA PC$3.50/MF$3.00
Wisconsin Univ-Milwaukee Dept of Electrical Engineering
Preserving Average Proximity in Arrays.
Interim rept.,
Richard A. DeMillo, Stanley C. Eisenstat, and Richard J. Lipton. 10 Mar 76, 14p UWM-TR-CS-76-4, ARO-12142.4-EL
Grants DAHC04-74-G-0179, NSF-DCR-74-12870
Prepared in cooperation with Yale Univ., New Haven, Conn. Dept. of Computer Science. Contract N00014-67-A-0097-0016.

Descriptors: *Arrays, *Graphs, *Trees, *Computer files, Proximity devices, Linear systems, Memory devices, Algorithms, Errors.
Identifiers: Graph embedding, List structures, Storage arrays, Binary trees, Page faults, *Computer storage management.

The combinatorial problem of storage arrays as various kinds of list structures is examined. Embeddings of graphs are used to model the loss of proximity involved in such storage schemes, and an elementary proof that arrays cannot be stored as linear lists with bounded loss of proximity is presented. Average loss of proximity is then considered, and it is shown that arrays cannot be stored as linear lists with only bounded loss of average proximity, but can be so stored in binary trees. The former result implies that row major order is an asymptotically optimal storage strategy for arrays. (Author)

AD-A027 421/7GA PC$6.75/MF$3.00
Illinois Univ At Urbana-Champaign Coordinated Science Lab
Optimal Searching Algorithms for Parallel-Pipelined Computers.
Technical rept.,
Daniel Lee Weller. Jun 76, 169p Rept nos. R-730, UILU-ENG-76-2216
Contract DAAB07-72-C-0259, Grant NSF-GJ-40584

Descriptors: *Computer architecture, *Algorithms, *Parallel processors, Central processing units, Memory devices, Pipelines, Time, Searching, Cost effectiveness, Theorems, Optimization, Theses.
Identifiers: *Parallel pipelined computers.

A new class of optimal search algorithms is presented for the classical problem of searching an ordered list. The appropriate algorithm is selected as a function of the order, (s,p), of the target processor which may consist of p parallel processors each of which is an s level pipelined processor. The algorithms, called W-searches, are structured according to a new integer series, the W-series. The W-searches include the binary search for processors of order (1,1), the Fibonacci search for processors of order (2,1), and well-known parallel searches for processors of order (1,p). (Author)

AD-A027 427/4GA PC$4.00/MF$3.00
Federal Cobol Compiler Testing Service Washington D C
Data General C-300 ECLIPSE COBOL Pre-release 0.0.5.
Validation summary rept.
1 Jul 76, 46p Rept no. CCVS74-VSR150
Supersedes previous VSRs for the subject compiler.

Descriptors: *Compilers, Programming languages, *Debugging(Computers), Computer program documentation, Computer programs, Standards, Subroutines, Validation.
Identifiers: COBOL, Computer software.

This Validation Summary Report (VSR) provides a consolidated summary of the results obtained from the validation of the subject compiler. The VSR is made up of several sections showing the discrepancies found. These include an overview of the validation which lists all categories of discrepancies by Federal level module; a section relating the categories of discrepancies to each of the Federal levels of the language; and a detailed listing of discrepancies together with the tests which were failed. (Author)

AD-A027 451/4GA PC$3.50/MF$3.00
Naval Surface Weapons Center Dahlgren Lab Va
Survey of Software Development Technology at the Naval Surface Weapons Center, Dahlgren Laboratory,
Robert Hein. Jul 76, 25p Rept no. NSWC/DL-TR-3511

Descriptors: *Computer program documentation, *Computer programs, Programming languages, High level languages, Machine coding, Computerized simulation, Debugging(Computers), Weapon systems, Military intelligence, Validation, Acceptability.
Identifiers: *Computer software, Structured programming.

Systems being developed at the Naval Surface Weapons Center, Dahlgren Laboratory (NSWC/DL), have benefitted from the formulation and refinement of techniques and technologies used in software development. Many ideas have been considered, implemented, improved, or rejected during the thirty years of developing software at the Dahlgren Laboratory. Some of the more important concepts that are used in the software development process are simulation modeling of hardware/software systems, program design language and structured programming languages, wrap-around simulations and instrumented emulators, and dedicated software support sites. These design and analysis tools and methodologies, when judiciously used, have helped to produce quality software at NSWC/DL. (Author)

AD-A027 454/8GA PC$4.00/MF$3.00
Stanford Univ Calif Dept of Computer Science
The Theoretical Aspects of the Optimal Fixedpoint,
Zohar Manna, and Adi Shamir. Mar 76, 26p Rept nos. STAN-CS-76-542, AIM-277
Contract DAHC15-73-C-0435, ARPA Order-2494
Report on Stanford Artificial Intelligence Project.

Descriptors: *Computer programming, *Recursive functions, *Semantics, Optimization, Mathematical logic, Theorems.
Identifiers: *Fixed point theorems.

In this paper the authors define a new type of fixedpoint of recursive definitions and investigate some of its properties. This optimal fixedpoint (which always uniquely exists) contains, in some sense, the maximal amount of 'interesting' information which can be extracted from the recursive definition, and it may be strictly more defined than the program's least fixedpoint. This fixedpoint can be the basis for assigning a new semantics to recursive programs.

AD-A027 455/5GA PC$4.50/MF$3.00
Stanford Univ Calif Dept of Computer Science
Automatic Program Verification V: Verification-Oriented Proof Rules for Arrays, Records, and Pointers,
David Luckham, and Norihisa Suzuki. Mar 76, 52p Rept nos. STAN-CS-76-549, AIM-278
Contract DAHC15-73-C-0435, ARPA Order-2494
Report on Stanford Artificial Intelligence Project. See also report dated Oct 75, AD-A019 569.

Descriptors: *Computer programming, Boolean algebra, Semantics, Memory devices, Allocations.
Identifiers: *Computer program verification, *Computer storage management, *Data structures, Axioms.

A practical method is presented for automating in a uniform way the verification of Pascal programs that operate on the standard Pascal data structures ARRAY, RECORD, and POINTER. New assertion language primitives are introduced for describing computational effects of operations on these data structures. Axioms defining the semantics of the new primitives are given. Proof rules for standard Pascal operations on pointer variables are then defined in terms of the extended assertion language. Similar rules for records and arrays are special cases. An extensible axiomatic rule for the Pascal memory allocation operation, NEW, is also given. These rules have been implemented in the Stanford Pascal program verifier. Examples illustrating the verification of programs which operate on list structures implemented with pointers and records are discussed. These include programs with side-effects.

AD-A027 519/8GA PC$7.50/MF$3.00
Bolt Beranek and Newman Inc Cambridge Mass
Development of a Communications Oriented Language.
Final rept. May 75-Mar 76 (Part 1).
20 Mar 76, 198p Rept no. BBN-3281-Pt-1
Contract DCA100-75-C-0051
See also Part 2, AD-A027 523.

Descriptors: *Programming languages, *Communications networks, Syntax, Compilers, Computer programming, Mathematical logic, Semantics, Real time.
Identifiers: *COL programming language.

A Communications Oriented Language (COL) is a high order language designed to be maximally effective as a vehicle with which to program communications applications. This document is a preliminary description of a design for a COL. The design philosophy and principles that lead to the COL are first discussed. Then the language is described, the syntax semi-formally using modified BNF and the semantics informally in English text. Some examples of COL programming are included. An appendix shows how machine-level instructions for a specific machine can be written in the COL, with an example showing interrupt processing.

AD-A027 523/0GA PC$6.75/MF$3.00
Bolt Beranek and Newman Inc Cambridge Mass
Development of a Communications Oriented Language. Task II. Development of the COL Concept and Syntax.
Final rept. May 75-Mar 76 (Part 2).
Arthur Evans, Jr., and C. Robert Morgan. 20 Mar 76, 166p Rept no. BBN-3261-Pt-2
Contract DCA100-75-C-0051
See also Part 1, AD-A027 519.

Descriptors: *Programming languages, *Communications networks, Syntax, Compilers, Computer programming, Mathematical logic, Semantics, Real time.
Identifiers: *COL programming language.

A Communications Oriented Language (COL) is a high order language designed to be maximally effective as a vehicle with which to program communications applications. This document is a preliminary description of a design for a COL. The design philosophy and principles that lead to the COL are first discussed. Then the language is described, the syntax semi-formally using modified BNF and the semantics informally in English text. Some examples of COL programming are included. An appendix shows how machine-level instructions for a specific machine can be written in the COL, with an example showing interrupt processing.

AD-A027 561/0GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Considerations in Applying Design to Cost to the Image Processing Segment of the Tactical Information Processing and Interpretation (TIPI) Program.
Student project rept.,
Barbara Rea Craun. May 75, 34p

Descriptors: *Image processing, *Tactical reconnaissance, *Photographic equipment, *Design to cost, *Photointerpretation, Information systems, Photographic processing, Full scale systems.
Identifiers: TIPI(Tactical information processing and interpretation), *Tactical information processing and interpretation, Unit production cost.

Four areas of concern are pursued in this study; specifically, the Tactical Information Processing and Interpretation (TIPI) and the Image Processing (IP) segment are reviewed prior to any attempt to investigate the Design to Cost (DTC) issues. The last two areas addressed are the DTC conceptual framework and the implications of the application of the concept to the IP segment. Of significance in the research of the TIPI and the IP segment is the fact the IP segment is entering full scale development and is considered to be a low risk effort. An equally significant discovery was the fact that there is limited coverage given to the DTC concept in either the Advance Procurement Plan or the statement of work. DTC appears deceptively simple; however, considerable time and effort must be expended by the IP segment office in order to transform the buzz-word into a meaningful concept. The cogent mechanisms which must be used as precursors of the transformation are the Request for Proposal and the contract provisions. Both must be structured to achieve a mutual understanding of not only the concept of DTC but also the specifics that will be required of the contractor. (Author)

AD-A027 580/0GA PC$5.50/MF$3.00
Logicon Inc San Diego Calif
ADAPT I Uniform Data Language (UDL): A preliminary Specification.
Interim rept. 1 May-1 Aug 76,
M. E. Solegiad. 23 Jul 76, 120p
Contract N00014-76-C-0899

Descriptors: *Data processing terminals, Data processing, *Data bases, Networks, Computer files, Management information systems, Military intelligence, Specifications.
Identifiers: *ADAPT system, *Data base management systems..

Under the ADAPT project, a prototype intelligent terminal will be developed which provides users and/or other systems a uniform interface for accessing multiple online data bases located on different systems. The underlying

technology applied by ADAPT will be the transformation from one uniform data language, UDL, to other target query languages which reside on a network. ADAPT will be comprised of four phases: ADAPT I will provide the fundamental ADAPT system architecture baseline for subsequent phases and also a limited user data base query and display facility for four data base management systems. ADAPT II will provide users a data base maintenance facility for four DBMSs, as well as data display enhancements. ADAPT III will produce two production models of ADAPT, one installed in network centers and the other as a stand-alone intelligent terminal. ADAPT IV will provide a local data base manager for onsite file creation. (Author)

AD-A027 639/4GA PC$4.00/MF$3.00
Rome Air Development Center Griffiss AFB N Y
Optimum Coherent Imaging of a Limited Field of View in the Presence of Angular and Aperture Noise,
Giorgio V. Borgiotti. May 76, 34p Rept no. RADC-TR-76-129

Descriptors: *Image restoration, *Information theory, Coherent radiation, Microwaves, Images, Image processing, Antenna apertures, Noise(Electrical and electromagnetic), Mathematical models.
Identifiers: *Microwave image reconstruction, *Antenna theory, Angular noise, Aperture noise.

An optimal procedure is established for the reconstruction of the angular object distribution in a given field of view (FOV). The object is coherently illuminated and located in the far zone of the receiving aperture. The procedure is 'uniformly' optimal in the sense of minimizing the statistical rms difference between the object distribution, modeled as a random function of the angular coordinates and its reconstructed image, for each direction belonging to the FOV. The observable complex amplitude distribution of the field on the aperture is due in the general case not only to the incident field scattered by the object but also to background disturbance, or 'angular noise', randomly distributed inside and outside the FOV, and is affected by 'measurement noise', that is random errors introduced in measuring the aperture field. The reconstruction algorithm consists of summing a truncated series of special functions - prolate spheroidal for the linear case and their generalization for two dimensional apertures - weighted by appropriate coefficients. These coefficients depend upon the observed aperture field and upon the relative power densities associated with the object field and the various types of noise. The series is truncated to a number of terms ('effective degrees of freedom' of the image) determined through an information theoretical method: each term of the series, suitably ordered, provides an information gain less than the preceding one, and the information gain goes rapidly to zero. The relationship between information transfer and mean-squared error for each term in the image series is established. Numerical examples are discussed. (Author)

AD-A027 659/2GA PC$5.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
An Introduction to Management of Weapons System Software Development.
Study project rept.,
Terrance M. Drabant. May 75, 95p

Descriptors: *Computer program documentation, *Computer programs, *Weapon systems, Computers, Management planning and control, Analog computers, Digital computers, History, Assemblers, Compilers, Computer programming, Programming languages.
Identifiers: *Computer software, Program management, Milestones.

The purpose of this study project is to apply the education the author has received at the Defense Systems Management School to the process of Management of Software Development. The specific goals of the teaching paper are: (1) to provide an overview of computers and software (Section II), (2) to describe the Software Development Cycle (Section III), (3) to describe management techniques within the Software Development Cycle (Section IV), (4) to cover some related subjects (Section V), and (5) to summarize the key points of successful management of software development (Section VI). This paper is important not only to the author (who is a manager of software development activities), but to DoD Program Managers who find themselves in the position of managing software development activities. This teaching paper is designed primarily for the reader who is unfamiliar with software and the successful production of software. Where possible, THE DoD weapons system acquisition environment is employed for comparative examples. (Author)

AD-A027 675/8GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Computer Resources Acquisition and Support for Air Force Weapons Systems.
Student project rept.,
Larry R. Walter. May 75, 32p

Descriptors: *Computer programs, *Computer program documentation, *Management information systems, *Weapon systems, *Computers, *Resource management, Interfaces.
Identifiers: *Computer software, Program management, Milestones.

The principal purpose of this paper is to review the current and proposed Air Force policy and guidance on management of computer resources in systems acquisition, identify some of the discrepancies between them and between the standards they implement, and discuss the prevalent problem areas. The purpose of the study group was to conduct an in-depth study of long-range computer software support required for aeronautical weapons system computers. The study was conducted in three distinct areas: Operational Flight Programs (OFP), Automatic Test Equipment (ATE), and Aircrew Trainers (Simulators). Some of the general conclusions were: a. Life cycle management is required. b. Organic support is a positive and necessary approach. c. Substantial benefits can be realized from standardization. d. Close coordination among software developers, maintainers, and users is essential. e. Hardware and software must be addressed jointly. f. A detailed implementation plan is needed for each area (AFP, ATE, Simulators) (4:10).

AD-A027 710/3GA PC$4.50/MF$3.00
Michigan Univ Ann Arbor Systems Engineering Lab
Preliminary Report on Results of Matrix Benchmarks on Vector Processors.
Interim rept.,
D. A. Calahan, W. N. Joy, and D. A. Orbits. 24 May 76, 72p SEL-TR-94, AFOSR-TR-76-0927 Grant AF-AFOSR-2812-75

Descriptors: *Computer applications, *Computations, *Simultaneous equations, Matrices(Mathematics), Bench tests, Computer programming, FORTRAN.
Identifiers: IBM-370/195 computers, CDC STAR-100 computers, CRAY-1 computer, AMDAHL-470V/6 computer, *Vector processors, Sparse matrices.

This preliminary report presents the results of running full matrix benchmarks on the CDC STAR 100, the Cray Research Cray-1, the Texas Instruments ASC (1-pipe and 4-pipe), the IBM 370/195, and the Amdahl 470V/6. An analysis is performed on timing results to correlate measured results with those predicted from manufacturer-supplied data. This benchmark effort is part of a study to measure the effectiveness of vector processors for (direct) solution of large sparse sets of simultaneous equations, and to develop new algorithms appropriate to classes of computer architecture.

NTIS/PS-76/0608/0GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Pattern Recognition. Volume 1. 1964-June, 1975 (A Bibliography with Abstracts).
Rept. for 1964-Jun 75,
David W. Grooms. Jul 76, 189p*

Descriptors: *Bibliographies, *Pattern recognition, *Character recognition, Signal processing, Coding, Color, Mapping, Data processing, Aerial photography.
Identifiers: *Image processing, Image enhancement, Image restoration, Feature extraction, Scene analysis, Edge detection.

The bibliography cites research in the areas of pattern recognition, character recognition, and image processing. It includes research in processing color pictures, coding methods, image enhancement and restoration, scene analysis and feature extraction. Theory and applications are also covered. (This updated bibliography contains 184 abstracts, none of which are new entries to the previous edition.)

NTIS/PS-76/0609/8GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Pattern Recognition. Volume 2. June 1975-June 1976 (A Bibliography with Abstracts).
Rept. for Jun 75-Jun 76,
David W. Grooms. Jul 76, 101p*
Supersedes NTIS/PS-75/514, and NTIS/PS-74/064.

Descriptors: *Bibliographies, *Pattern recognition, *Character recognition, Signal processing, Coding, Color, Mapping, Data processing, Aerial photography.
Identifiers: *Image processing, Image enhancement, Image restoration, Feature extraction, Scene analysis, Edge detection.

The bibliography cites research on pattern recognition, image processing, and character recognition. Research on processing color pictures, coding methods, image enhancement and restoration, feature extraction, edge detection, and scene analysis are included. (This updated bibliography contains 184 abstracts, 88 of which are new entries to the previous edition). See also NTIS/PS-76/0608, Pattern Recognition, Vol. 1, 1964-June, 1975.

NTIS/PS-76/0631/2GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Computer Networks. Volume 1. 1969-June, 1975 (A Bibliography with Abstracts).
Rept. for 1969-Jun 75,
David W. Grooms. Aug 76, 250p*

Descriptors: *Bibliographies, *Computer networks, Computer programming, Computer systems hardware, Telecommunication, Time sharing, Queueing theory, Scheduling, Data transmission, Economic analysis.
Identifiers: Communications networks, ARPA computer network, ALOHA system, GLOBNET system, OCTOPUS computer network, TENEX system, AUTOVON system, PLATO system, Distributed networks.

The citations present research on computer networks including hardware, software, data transmission, time sharing, and applicable theory to network design. Specific studies on the ARPA network, the ALOHA system, and GLOBNET are included. (This updated bibliography contains 245 abstracts, none of which are new entries to the previous edition.)

NTIS/PS-76/0632/0GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Computer Networks. Volume 2. July 1975-July 1976 (A Bibliography with Abstracts).
Rept. for Jul 75-Jul 76,
David W. Grooms. Aug 76, 180p*
Supersedes NTIS/PS-75/824, and COM-74-11572.

Descriptors: *Bibliographies, *Computer networks, Computer programming, Computer systems hardware, Telecommunication, Time sharing, Queueing theory, Scheduling, Data transmission, Economic analysis.
Identifiers: Communications networks, ARPA computer network, ALOHA system, GLOBNET system, OCTOPUS computer network, TENEX system, AUTOVON system, PLATO system, Distributed networks.

The bibliography cites research on computer networks including hardware, software, data transmission, time sharing, and applicable theory to network design. Specific studies on the ARPA network, the ALOHA system, the GLOBNET system, the OCTOPUS network, the TENEX system, the AUTOVON system, the PLATO system, distributed networks, and other such systems are cited. (This updated bibliography contains 175 abstracts, all of which are new entries to the previous edition.) See also NTIS/PS-76/0631, Computer Networks, Vol. 1, 1969-June, 1975.

NTIS/PS-76/0667/8GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
The Use of Computers in Solving Mathematical Problems (A Bibliography with Abstracts).
Rept. for Jun 71-Jun 76,
David W. Grooms. Aug 76, 286p*
Supersedes NTIS/PS-75/485, and COM-74-11454.

Descriptors: *Bibliographies, *Theory of equations, *Differential equations, *Computer applications, *Computation, Computer programming, Matrices(Mathematics), Partial differential equations, Statistical analysis, Mathematical programming, Integral equations, Algorithms.
Identifiers: Stiff differential equations, Sparse matrices.

Research is presented on the computer solution of algebraic and differential equations. The necessary software and hardware for implementation as well as solutions to large sparse matrices, stiff differential equations, and statistical problems are included. Some of the research is directly applicable to the various physical sciences. (This updated bibliography contains 281 abstracts, 51 of which are new entries to the previous edition.)

NTIS/PS-76/0669/2GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Computer Storage Management (A Bibliography with Abstracts).
Rept. for 1964-Aug 76,
David W. Grooms. Aug 76, 157p*
Supersedes NTIS/PS-75/528, and NTIS/PS-74/095.

Descriptors: *Bibliographies, *Computer storage devices, Semiconductor computer storage, Read only storage, Allocations, Computer programming, Compilers.
Identifiers: *Computer storage management, Paging, Virtual memory, File structures.

The cited research covers dynamic storage allocation, paging, interleaved memory, and virtual memory. Also included are the necessary programs, compilers, and algorithms for implementation in various computer systems. (This updated bibliography contains 152 abstracts, 34 of which are new entries to the previous edition.)

N76-25340/0GA PC$7.50/MF$3.00
Rockwell International Corp., Anaheim, Calif. Electronics Res. Div.
Development of a High Capacity Bubble Domain Memory Element and Related Epitaxial Garnet Materials for Application in Spacecraft Data Recorders. Item 2: The Optimization of Material-Device Parameters for Application in Bubble Domain Memory Elements for Spacecraft Data Recorders.
Final Report, 18 Feb. 1974 - 31 Oct. 1975.
P. J. Besser. Jun 76, 184p NASA-CR-144960, C74-192/501
Contract NAS1-12981

Descriptors: *Airborne/spaceborne computers, *Bubble memory devices, *Magnetic domains, *Magnetic materials, Crystal growth, Epitaxy, Garnets, Semiconducting films, Spacecraft electronic equipment.
Identifiers: *Magnetic bubble domains.

For abstract, see STAR 1416

N76-25825/0GA PC$3.50/MF$3.00
Rice Univ., Houston, Tex. Inst. for Computer Services and Applications.
An Algorithm for Extraction of More Than One Optimal Linear Feature from Several Gaussian Pattern Classes.
R. J. P. Defigueiredo, K. C. Pau, A. D. Sagar, S. A. Starks, and D. L. Vanrooy. Apr 76, 16p NASA-CR-147782, ICSA-TR-275-025-026
Contract NAS9-12776

Descriptors: *Algorithms, *Data reduction, Optimization, *Pattern recognition, *Remote sensors, Numerical analysis, Probability density functions, Probability theory, Risk.
Identifiers: *Feature extraction.

For abstract, see STAR 1416

N76-25833/4GA Not available NTIS
Atomic Energy of Canada Ltd., Pinawa (Manitoba). Whiteshell Nuclear Research Establishment.
Conversion of Digital Equipment Corporation Pdp-8 Fortran (8K) to Interruptable Operation.
H. J. Bridges. Jun 75, 54p AECL-4663

Descriptors: *Computer programming, *Fortran, *Pdp 8 computer, Computer systems programs, Input/output routines.
Identifiers: Canada.

For abstract, see STAR 1416

N76-25834/2GA Not available NTIS
Atomic Energy of Canada Ltd., Chalk River (Ontario). Chalk River Nuclear Labs.
FAUTRAN: A Fault Tree Analyser.
P. Y. Wong. Aug 75, 43p AECL-5182

Descriptors: *Computer programs, *Failure analysis, Trees (Mathematics), Probability theory, Reliability engineering.
Identifiers: *FAUTRAN computer program, Canada, Fault tree analysis.

For abstract, see STAR 1416

N76-26027/2GA PC$6.75/MF$3.00
Boeing Commercial Airplane Co., Seattle, Wash.
Timeline Analysis Program (TLA-1).
Final Report.
K. H. Miller. Apr 76, 159p NASA-CR-144942, D6-42377-5
Contract NAS1-13741

Descriptors: *Computer programs, *Evaluation, *Human factors engineering, *Man machine systems, *Tasks, *Work, Computerized simulation, Flight control, Flight crews, Terminal guidance.
Identifiers: *TLA-1 computer program.

For abstract, see STAR 1416

N76-26028/0GA PC$10.50/MF$3.00
Boeing Commercial Airplane Co., Seattle, Wash.
Timeline Analysis Program (TLA-1), Appendices.
Final Report.
K. H. Miller. Apr 76, 354p NASA-CR-144943, D6-42377-6
Contract NAS1-13741

Descriptors: *Computer programs, *Evaluation, *Human factors engineering, *Man machine systems, *Tasks, *Work, Atlanta (Ga), Computerized simulation, Flight control, Flight crews, Terminal guidance.
Identifiers: *TLA-1 computer program.

For abstract, see STAR 1416

N76-26034/8GA Not available NTIS
Joint Inst. for Nuclear Research, Dubna (USSR).
Information Retrieval System of JINR.
D. D. Arnaudov, and N. N. Govorun. 1975, 16p JINR-E10-8855

Descriptors: *Document storage, *Information retrieval, Cobol, Magnetic disks, Response time (Computers).
Identifiers: USSR.

For abstract, see STAR 1416

N76-26035/5GA Not available NTIS
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Some Combinatorial Properties of a Class of Associative Characteristic Structures.
V. M. Sumarokov. 1975, 18p JINR-P11-9103
Language in Russian.

Descriptors: Algorithms, *Combinatorial analysis, *Information retrieval, Computer techniques, Search profiles, Trees (Mathematics).
Identifiers: USSR.

For abstract, see STAR 1416

PAT-APPL-673 230/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Parallel to Serial Digital Converter.
Patent Application,
Harry J. Koenig. Filed 2 Apr 76, 20p AD-D002 598/1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Converters, *Data processing equipment, Digital systems, Signal processing, Shift registers, Data transmission systems.
Identifiers: *Parallel to serial digital converters, *Patent applications, PAT-CL-340-347.

The patent application relates to a high speed parallel to serial digital converter which includes a data shift register, a control shift re-

gister and control circuitry. During a control cycle a control input comprising a set of control bits in parallel form is converted by the control shift register into serial form. The serialized control bits are coupled to a register load selector which responds to the control bits to appropriately signal the control circuitry so that at the end of the control cycle the converter will commence either another control cycle or a data cycle. During a data cycle an input data word comprising data bits in parallel form is converted by the data shift register into serial form. At the end of a data cycle timing circuitry signals the control circuitry to commence a reset cycle during which the converter is reset to commence another control cycle.

PAT-APPL-679 253/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
Random Action Event Switching Method and Apparatus for a Multiple Input Data Processing System.
Patent Application,
Joseph F. Schneider. Filed 21 Apr 76, 17p AD-D002 625/2
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Data processing, *Data processing equipment, Order circuits, Multiple operation.
Identifiers: PAT-CL-340-172.5, *Patent applications.

The patent application relates to the acceptance of all events and the processing of such events without lock-out in a multiple input data processing system achieved by a random action event switching technique. Processing of all events in order of arrival is accomplished by providing an input line for each system input on which the priority of the received event is registered with the resolution of the switch timing clock. Events arriving on other lines during the same time resolution element are processed with equal priority but with identity preserved. At the end of each time interval accumulated events are switched to one of a multiplicity of event holding lines, there being fewer event holding lines than input lines, and the input lines are cleared to receive subsequently arriving events. Event holding lines are filled in selected sequence and are switched to the data system main processor for read-out according to the priority of arrival of the events they hold and in response to main processor availability signals.

PATENT-3 927 391 Not available NTIS
Department of the Navy Washington D C.
Technique for Ranking Data Observations.
Patent,
Ben H. Cantrell. Filed 25 Mar 75, patented 16 Dec 75, 6p AD-D002 645/0, PAT-APPL-561 966
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Logic circuits, *Arithmetic units, Computations, Shift registers, Analog to digital converters, Radar.
Identifiers: PAT-CL-340-146-2.

The present invention relates to an improved technique for ranking a sequence of numbers representing data observations and more particularly to a system and technique for computing the rank of all sets of numbers of length n of a long sequence of numbers.

9C. Electrical and Electronic Engineering

AD-A027 167/6GA PC$5.00/MF$3.00
Logistics Management Inst Washington D C
DOD Demand for Selected Avionic Assemblies,
William B. Fisher, and Jeanne M. White. Jun 76, 92p Rept no. LMI-75-9
Contract SD-321

Descriptors: *Avionics, *Electronics, *Military requirements, Military budgets, Costs, Department of defense, Global positioning system, Collision avoidance, Military aircraft, Navigation, Display systems, Communication equipment, Identification systems, Data Links, Remotely piloted vehicles.

Projections are limited to the communications, navigation, identification (CNI) and display functional areas. However, the methodology can be applied to other avionics and electronic functional categories. A data audit trail has been maintained to permit updating of the projections. A hierarchical structure of individual avionics functional requirements (e.g., inertial navigation capability) was used for the computer based model which produced the projections.

AD-A027 184/1GA PC$4.50/MF$3.00
Science Applications Inc Berkeley Calif
Evaluation of Present Internal Electromagnetic Pulse Interaction Technology: Description of Needed Improvements.
Final rept.,
F. M. Tesche, M. A. Morgan, and B. H. Fishbine. May 76, 57p AFWL-TR-75-288
Contract F29601-75-C-0112

Descriptors: *Internal electromagnetic pulses, *Coupling(Interaction), Electromagnetic fields, Mathematical models, Transmission lines, State of the art, Statistical analysis, Multiconductor cables, Electric cables, Aircraft.
Identifiers: Bulk current.

This report presents a description of the state of the art in the area of internal electromagnetic pulse (EMP) interaction technology. Improvements in the modeling methodology are suggested and a number of specific problems are described which will permit more accurate solutions to problems in this area. (Author)

AD-A027 302/9GA PC$3.50/MF$3.00
Princeton Univ N J
A Shot Process with Burst Properties,
James H. Gilchrist, and John B. Thomas. 29 Oct 74, 16p ARO-7624.57-EL
Contract DAHC04-69-C-0012, Grant NSF-GK-24187
Availability: Pub. in Adv. Appl. Prob. 7 p527-541 1975.

Descriptors: *Electronic equipment, Power spectra, Random variables, Stochastic processes, Noise(Electrical and electromagnetic), Mathematical models, Density, Clustering, Reprints.
Identifiers: *Shot processes.

A shot process with bursts of events is constructed using an occurrence time structure similar to that of clustering point processes. The characteristic function and a simple functional form for the power spectral density of the process are found. It is shown that the burst property might not be observable. Applications of a specific example of this process are given in modeling a 1/f noise commonly found in some electronic components. (Author)

AD-A027 362/3GA PC$9.00/MF$3.00
Georgia Inst of Tech Atlanta
Federal Aviation Administration - Georgia Institute of Technology Workshop on Grounding, Bonding and Shielding.
Final rept.
May 76, 260p FAA-RD-76-104
Contract DOT-FA72WA-2850
See also Rept. nos. FAA-RD-74-147, AD-785 858 and FAA-RD-75-106, AD-A013 618.

Descriptors: *Avionics, *Electronic equipment, *Ground(Electrical), *Electrical equipment, *Electrical grounding, Shielding, Electromagnetic shielding, Noise(Electrical and electromagnetic), Lightning arresters, Surges, Test methods, Electromagnetic shielding, Electromagnetic interference, Bonding, Protection, Transients, Workshops(Meetings).

A state-of-the-art review and background research reveals a significant divergence of opinion as to the preferred techniques of grounding of electronic equipment and systems. There exists an absence of agreement on a unified approach to grounding which is applicable to all frequency ranges and signal types. The Systems Research and Development Service of the Federal Aviation Administration in conjunction with the Georgia Institute of Technology conducted a workshop which brought together distinguished experts in the fields of grounding, lightning and electromagnetic compatability. This report contains the papers presented at the workshop. This is the third workshop conducted on the subject of grounding. The papers presented at the 1974 and 1975 workshops are contained in Report No's FAA-RD-74-147 and FAA-RD-75-106. (Author)

AD-A027 407/6GA PC$4.50/MF$3.00
Cold Regions Research and Engineering Lab Hanover N H
Heat Sinks: A Study of Variable Types of Heat Sinks (En Undersoegelse af Forskelligt Udformede Koleprofiler. Forskellige Faktorers Indflydelse pa Profilets Virkning),
U. Fabricius. Jan 76, 58p Rept no. CRREL-TL-508
Trans. from Danish Research Center for Applied Electronics 70p 1974.

Descriptors: *Heat sinks, *Electronic equipment, *Heat transfer, Thermal resistance, Temperature, Experimental design, Optimization, Convection(Heat transfer), Conduction(Heat transfer), Radiative transfer, Loading(Electronics), Comparison, Theory, Profiles, Computer programs, Translations, Denmark.
Identifiers: Temperature distribution.

Twelve various types of heat sinks are included in this investigation, which is stressing a comparison between the profiles rather than a comparison between manufactures. It has been examined as to how much power can be added to the heat sink at intermittent service without influencing the junction temperature of the power component to exceed a tolerated maximum temperature. (Author)

AD-A027 450/8GA PC$3.50/MF$3.00
Air Force Weapons Lab Kirtland AFB N Mex
Irradiated Electronic Reliability Study.
Final rept.,
Bernd Deve, and Chris Ashley. Jul 76, 18p Rept no. AFWL-TR-76-125

Descriptors: *Electronic equipment, *Radiation damage, *Reliability(Electronics), Modules(Electronics), Integrated circuits, Integrated circuits, Semiconductor devices, Ionizing radiation, Air Force equipment, Vulnerability, Guidance, Control systems, Failure(Electronics).

In 1969 the U.S. Air Force withdrew approximately 790 modules of electronics circuitry, in the form of 10 operational guidance and control

systems, from the field and irradiated them. A module consists of an average of about 25 small scale integrated circuits, 45 discrete semiconductor devices, and miscellaneous R, L, and C components. The average total dose used was approximately 1800 rads(Si) of 4.2 MeV mean bremsstrahlung. This dose was distributed over 8 to 10 pulses per system, with average half power width approximately 72 nanoseconds per pulse. The average (over all modules) maximum half-power-point-rate was about 6.4E9 rads(Si)/sec. The irradiated modules were then returned to field service. A primary objective of the radiation tests was to determine the photocurrent induced latchup susceptibility of the guidance and control system to known short duration pulses of radiation. The purpose of this report, in contrast, is to indicate how that radiation testing affected the longer term reliability of the electronics circuitry via certain other mechanisms, assuming that any immediately obvious radiation damage was corrected. Six years later, in 1975, failure and repair records were analyzed statistically to determine whether the radiation had functionally affected the electronics. There remained 650 irradiated modules available for this statistical analysis after culling. These modules had been carefully associated by individual serial number with approximately 1050 modules in field use which were not irradiated and which served as controls. (Author)

AD-A027 520/8GA PC$5.50/MF$3.00
Westinghouse Electric Corp Baltimore Md
Modular Packaging Approaches. Volume I.
Interim rept. 1 Jun-30 Nov 75,
W. W. Staley. Jun 76, 101p 75-1161, AFAL-TR-76-61-Vol-I
Contract F33615-75-C-1269

Descriptors: *Avionics, *Modules(Electronics), Standardization, Packaging, Trade off analyses.

The objective of the study is to investigate the feasibility, practicality, and implementation of standard electronic modules (SEM) for avionics. Tradeoff studies are used to provide quantitative data to assist the Air Force Engineers in selecting the SEM format(s). The broad spectrum of considerations necessary to characterize standard packaging for a wide class of avionics applications are investigated. In depth quantification is placed primarily on digital signal processing and to a lesser degree on analog circuitry. The work is performed in three tasks whereby Task I evaluates current and past industry and DOD module programs, Task II studies present technology and technology trends for determination of the standard avionics module(s), and Task III is a compilation of industry and DOD data concerning standard module information and concepts. The report describes the details of the study with conclusions made and recommendations for future work to be considered.

AD-A027 553/7GA PC$4.00/MF$3.00
Electronics Engineering Group (1842nd) Richards-Gebaur AFB Mo
Grounding Systems.
Technical rept.,
John F. Zych. 1 Apr 76, 38p Rept no. 1842 EEG/EPEUE-TR-76-4

Descriptors: *Ground(Electrical), *Electrical equipment, Electronic equipment, Air Force facilities, Electric connectors, Electric conductors, Ground support equipment, Tactical communications.
Identifiers: Facility grounding systems.

Many Air Force facilities, consisting of diverse electronic equipments, subsystems, and systems, may be located in a single room or distributed over large areas. When interconnected, many incompatible signals may be present. Since the correct operation of complex electronics facilities depends upon the control of unwanted interaction between signals, the proper grounding of a system becomes imperative. In this respect, this report attempts to clarify grounding procedures to be used in Air Force facilities, subsystems, and systems for the purpose of precluding unwanted interaction and interference within facilities and between equipments. (Author)

AD-A027 678/2GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Advanced Avionics for the A-10: A Decision Analysis Model.
Student project rept.,
Jackson A. Thomas. May 75, 48p

Descriptors: *Avionics, *Decision making, *Management planning and control, Models, Computers, Inertial navigation, Forward looking infrared systems, Countermeasures, Lasers, Attack aircraft, Costs, Weapon system effectiveness.
Identifiers: Program management, A-10 aircraft, Weapon computers.

Using decision analysis techniques a generic decision model for potential avionics enhancements to the A-10 aircraft is developed. Five generic avionics additions and the baseline single seat aircraft are considered in the decision model. Aspects of systems acquisition and the impact of war are also incorporated. The model developed provides the basis for a flexible management tool that can assist the program manager in reaching a decision, if one should be required, concerning avionics additions to the A-10 aircraft. The model demonstrates how the decision analysis techniques can be applied to an unstructured decision problem encountered in program management. (Author)

AD-B004 228/3GA PC$5.00/MF$3.00
Hughes Aircraft CO Fullerton Calif Ground Systems Group
Millimeter-Wave System EMC Study.
Quarterly progress rept. no. 3, 6 Aug-6 Nov 74,
Glenn G. Sundberg, and Robert F. Marsolais. Apr 75, 84p FR-75-10-238, ECOM-74-0171-3
Contract DAAB07-74-C-0171
Distribution limitation now removed.

Descriptors: (*Electromagnetic compatibility, Millimeter waves), (*Radiofrequency interference, Millimeter waves), (*Communication equipment, *Radar equipment), Spectrum signatures, Radar antennas, Computer programs, Computer aided design, Electromagnetic shielding, HOrn antennas, Sidelobes, Ka band, Waveguides, Modulation.

This report presents the results obtained from experiments and analysis performed during the third quarter effort of the Millimeter Wave Electromagnetic Compatibility Study. The period covered is from 6 August to 6 November 1974. The major effort in the third quarter consists of performance of experiments which are related to the millimeter wave study, computer analysis of electromagnetic compatibility requirements for typical Army deployments, analysis of modulation effects, analysis of out-of-band antenna characteristics and initiation of the recommended EMC test program for millimeter wave system. Experiments ten through fourteen were performed during this quarter. These experiments involved electromagnetic compatibility evaluation of millimeter wave communication and radar systems. Shielding and reflectivity tests were performed to determine the effects of building and equipment enclosures materials on propagation and scattering of millimeter wave emissions.

AD-B004 473/5GA PC$5.00/MF$3.00
Hughes Aircraft CO Fullerton Calif Ground Systems Group
Millimeter-Wave System EMC Study.
Final rept. 6 Feb 74-6 Feb 75,
Glenn G. Sundberg, and R. F. Marsolais. Apr 75, 100p FR-75-10-284, ECOM-74-0171-F
Contract DAAB07-74-C-0171
Distribution limitation now removed.

Descriptors: (*Electromagnetic compatibility, *Millimeter waves), (*Radiofrequency interference, Microwave equipment), Communication equipment, Specifications, Electronic equipment, Spurious effects, Antennas, Electromagnetic shielding, Power amplifiers, K band, Radar signals, Intermodulation, Receivers, Atmospheres, Attenuation.

This report presents the results of a 12 month study program designed to obtain data on millimeter wave system electromagnetic compatibility characteristics. The period covered is from 6 Feb 1974 to 6 Feb 1975. Results described in the first three quarterly progress reports (references 1, 2 and 3) are summarized. Activities of the fourth quarter are described and recommendations for requirements of the millimeter wave electromagnetic compatibility specifications are included. The millimeter wave electromagnetic compatibility study was performed with the objective of obtaining data which can be applied in establishing an electromagnetic compatibility specification for millimeter wave systems operating in the frequency range of 10 to 100 GHz. The effort was designed to investigate millimeter wave EMC problems, to recommend electromagnetic interference reduction techniques and to up date present military EMC specifications and standards to include millimeter wave systems.

AD-B22 973/3GA PC$4.50/MF$3.00
Hughes Aircraft CO Fullerton Calif Ground Systems Group
Millimeter Wave System Electromagnetic Compatibility Study.
Quarterly Progress rept. no. 1, 6 Feb-6 May 74,
Glenn G. Sundberg. Jun 74, 74p ECOM-0171-1-74
Contract DAAB07-74-C-0171
Distribution limitation now removed.

Descriptors: (*Electromagnetic compatibility, Millimeter waves), (*Radio interference, Communication and radio systems), (*Microwave communications, *Secure communications), Ship to shore, Preamplifiers, Radiofrequency oscillators, Data links, Backward wave oscillators, Lens antennas, Impatt diodes, Communication equipment, Electronic equipment, Low costs, Atmospheres, Absorption, KA band, Multiplexing, Radar equipment.

This report presents the results during the first quarter effort of the millimeter wave electromagnetic compatibility study. This period covered is from 6 February 1974 to 6 May 1974. The major effort in the first quarter consisted of the collection of data from previous programs which are related to the millimeter wave EMC study and preliminary test planning for the experimental test program. Millimeter-wave system operations relative to EMC characteristics are summarized. A review of EMI test procedures, instrumentation, modified limits and EMI test results of previous millimeter-wave programs are included. Excerpts from previous millimeter-wave reports and papers are included in this report. These reports contain a significant amount of data on various aspects of millimeter-wave systems. A large amount of data is available on millimeter-wave antenna characteristics. Much research has been performed on the affects of atmospheric propagation characteristics at millimeter-wave frequencies. The atmospheric windows and anti-windows are described within this document. Preliminary test plans for the experimental program are described. Shortcomings in available data for use in developing a standard for a millimeter-wave system EMC testing and

evaluation were taken into account in planning the experimental program. (Author)

AD-923 745/4GA PC$5.00/MF$3.00
Hughes Aircraft CO Fullerton Calif Ground Systems Group
Millimeter-Wave System EMC Study.
Quarterly progress rept. no. 2, 6 May 74-6 Aug 74,
Glenn G. Sundberg. Sep 74, 83p FR-74-10-740, ECOM-0171-2-74
Contract DAAB07-74-C-0171
Distribution limitation now removed.

Descriptors: (*Millimeter waves, Electromagnetic compatibility), Electronic equipment, Oscillators, Mixers(Electronics), Transmitters, Receivers, K band, V band, Radiofrequency interference.
Identifiers: W band.

The major effort in the second quarter consisted of experiment planning and performance of the EMC experimental test program. A preliminary effort has also begun on the analysis portion of the program. Computer programs are being developed to assist in an EMC analysis of millimeter wave systems with emphasis on interference prediction of various deployments that may be employed in present and future applications of millimeter wave systems. Experimental procedures, objectives, performance, instrumentation, test set ups, results, and conclusions of the experiments performed are described on nine experiments, two analysis programs and preliminary effort on the interference prediction. Millimeter wave systems in the K band (20 to 40 GHz), V band (50 to 70) and W band (80 to 100 GHz) have been investigated during this period. EMC instrumentation with continuous coverage from 10 to 100 GHz has been evaluated. Breadboard set ups for evaluation of millimeter wave systems and components have been developed with capabilities of measuring millimeter signals and fields up to 120 GHz.

9D. Information Theory

AD-A027 225/2GA PC$4.00/MF$3.00
Massachusetts Inst of Tech Lexington Lincoln Lab
Properties of Matched and Mismatched Kalman Filters.
Technical note,
Michael Athans, and Dieter Willner. 26 Apr 76, 43p TN-1976-22, ESD-TR-76-27
Contract F19628-76-C-0002

Descriptors: *Kalman filtering, *Matched filters, *Signal processing, Least squares method, White noise, Equations, Residual, On line systems, Computations.

The purpose of this report is to examine the properties of Kalman-Bucy filters, especially in the case of mismatching, i.e., when the nominal parameters used in the realization of the Kalman-Bucy filter are different from the actual plant parameters. In such cases, the mismatched filters give rise to bias and RMS errors. By making tests upon signals that appear in the filter, e.g., the residuals, one can detect the existence of mismatching. Hence, by knowing the properties of both matched and mismatched filters, one can then attempt to correct the estimates of the mismatched filters by on-line signal processing. (Author)

AD-A027 429/8GA PC$5.00/MF$3.00
Cnr Inc Newton Mass
HF Channel Simulation.
Final rept. 15 Oct 73-14 Apr 74,
Robert W. Pinto, and Phillip A. Bello. 14 May 74, 89p Rept no. CNR-14
Contract N00014-74-C-0048

Descriptors: *Channels, *Information theory, *Radio transmission, Radio links, Pseudo noise systems, Probes(Electromagnetic), Signal processing, Simulation, Simulators, Playback, Computer programs, Multipath transmission, High frequency, Measurement.
Identifiers: *Stored channel simulators, *Time varying channels.

The stored channel simulator is capable of measuring and reproducing a linear time-variant HF channel over a finite bandwidth. Simulator software has been written which performs all required signal processing functions in the four major areas this project encompassed: (1) PN probing; (2) channel measurement; (3) channel playback; (4) simulator verification by means of a deterministic time-varying test channel. Significant attention is given to the effect of channel characteristics on simulator parameter values and software structure. (Author)

AD-A027 430/8GA PC$5.50/MF$3.00
Cnr Inc Newton Mass
HF Channel Simulation.
Final rept. (Part 2), 15 Apr 74-28 Feb 75,
Robert W. Pinto, and Phillip A. Bello. 31 Mar 75, 116p Rept no. CNR-14-2
Contract N00014-74-C-0048

Descriptors: *Channels, *Information theory, *Radio transmission, Radio links, High frequency, Probes(Electromagnetic), Signal processing, Doppler effect, Multipath transmission, Simulation, Simulators, Playback, Measurement.
Identifiers: *Stored channel simulators, *Time varying channels.

The process of probing and measuring an HF channel for use in a stored channel simulator will prove useful only when the investigator has some knowledge of the channel conditions. Of particular interest are the channel Doppler characteristic and multipath structure. The operations required to provide a measure of these parameters include: (1) complex channel reconstruction; (2) prefiltering to improve delay resolution; (3) channel snapshot generation; and (4) Doppler estimation. A set of flexible Fortran programs which meet these specifications are described in detail. Software verification is achieved by means of a program generated single sideband HF test channel. In addition, programming changes to the previously reported channel measurement and reproduction software are documented. These result in significant decreases in computation time. (Author)

AD-A027 452/2GA PC$4.00/MF$3.00
Michigan Univ Ann Arbor Cooley Electronics Lab
Some Aspects of the Weiner Noise Model.
Technical memo.,
K. Metzger. Jul 76, 26p Rept nos. CEL-TM-111, 013376-3-M
Contract N00014-75-C-0175

Descriptors: *White noise, *Gaussian noise, Autocorrelation, *Filters, Laplace transformation, Transfer functions, Linear systems, Power spectra, Approximation(Mathematics).
Identifiers: *Random processes, Autocorrelation functions, *Wiener processes.

The output of a filter whose input is white Gaussian noise is often a good model of random processes which are encountered in the physical world. This memo provides a tutorial discussion of the relationships between the filter transfer functions, the autocorrelation function of the output noise process and the bilateral Laplace transform of this autocorrelation function. Also considered is the use of a truncated Maclaurin series as an approximation to the autocorrelation function for small time shifts. (Author)

AD-A027 544/6GA PC$3.50/MF$3.00
Polytechnic Inst of New York Farmingdale Dept of Electrical Engineering and Electrophysics
A New Algorithm in Spectral Analysis and Band-Limited Extrapolation,
Athanasios Papoulis. 5 Nov 74, 10p AFOSR-TR-76-0645
Contracts N00014-67-A-0438-0017, F44620-69-C-0047
Availability: Pub. in IEEE Transactions on Circuits and Systems, vCAS-22 n9 p735-742 Sep 75.

Descriptors: *Fourier transformation, Algorithms, Extrapolation, Fourier spectroscopy, Convergence, Fast fourier transforms, Analog to digital converters, Reprints.
Identifiers: Signal processing, Spectrum analysis.

If only a segment of a function is given, then its Fourier spectrum is estimated either as the transform of the product of the function with a time-limited window, or by certain techniques based on various a priori assumptions. In the following, a new algorithm is proposed for computing the transform of a band-limited function. The algorithm is a simple iteration involving only the fast Fourier transform (FFT). The effect of noise and the error due to aliasing are determined and it is shown that they can be controlled by early termination of the iteraction. (Author)

AD-A027 553/5GA PC$4.00/MF$3.00
Purdue Univ Lafayette Ind School of Electrical Engineering
Efficient Error-Correcting Syntax Analysis for Recognition of Noisy Patterns,
S. Y. Lu, and K. S. Fu. Mar 76, 31p TR-EE76-9, AFOSR-TR-76-0693
Grant AF-AFOSR-2661-74

Descriptors: *Error correction codes, Pattern recognition, Syntax, Grammars, White noise, Stochastic processes, Parsers, Algorithms, Computations.

The use of a stochastic error-correcting parser for recognition of noisy and distorted patterns often results in a process of high accuracy, but with low efficiency. In this paper stochastic error-correcting parsers are formulated to include substitution, addition, and deletion errors. In order to make the syntax analysis practically feasible, a sequential classification algorithm with error-correcting capability is proposed. Considerable amount of parsing time can be saved by using the sequential algorithm. Computational results based on the classification experiments of noisy patterns for both non-sequential and sequential error-correcting parsers are presented.

N76-25826/8GA Not available NTIS
Democritus Nuclear Research Center, Athens (Greece).
Time Domain Synthesis of Digital Laguerre Filters.
R. E. King, and P. N. Paraskevopoulos. Jun 75, 38p DEMO-75/5

Descriptors: *Digital filters, *Orthogonal functions, *Signal processing, Algorithms, Approximation, Computerized design, Error analysis.
Identifiers: Greece, Laguerre filters.

For abstract, see STAR 1416

9E. Subsystems

AD-A027 289/8GA PC$4.00/MF$3.00
Naval Electronics Lab Center San Diego Calif
Dipole Broadband VHF Antenna. Lightweight 30-76-MHz Dipole Functions as the Electrical Equivalent of the 400-lb AS-2231.
Technical document 1 Jul 74-15 Jan 76,

Eric A. Thowless. 13 Apr 76, 33p Rept no. NELC/TD-472

Descriptors: *Dipole antennas, *Ship antennas, *Omnidirectional antennas, *Broadband antennas, Very high frequency, Joint military activities, Scale models, Field tests, Standing wave ratios, Amphibious ships.

An antenna is developed for use aboard amphibious ships and at fixed unit command centers ashore. Electrical concept feasibility is demonstrated in laboratory tests. The 50-60-lb vhf broadband dipole antenna will function as the electrical equivalent of the 400-lb AS-2231 aboard ship, and, used ashore, will enable a significant reduction in number of vhf antennas required at command sites. The effort demonstrates that a universal vhf broadband antenna - capable of satisfying the diverse requirements of the Navy, the Marine Corps, and the Army - is not likely to be achieved. (Author)

AD-A027 449/9GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Matrix Element Display Devices and Their Application to Airborne Weapon Systems.
Wayne L. Martin, and Harry L. Task. Jul 76, 12p Rept no. AMRL-TR-76-49

Descriptors: *Liquid crystal display systems, *Light emitting diodes, *Matrix displays, *Weapon systems, *Target recognition, Airborne, Density, Resolution, Slant range, Sizes(Dimensions), Viewers.

A study was performed to determine the impact of two important matrix display design variables on tactical target recognition performance. Element density (i.e., the number of individual display resolution elements per degree as viewed by the observer) and the percent active area on the display surface were experimentally manipulated by adjusting the viewing distance from a rear projection screen over which a grid mask was placed. The targets were presented to subjects using zoom imagery at a simulated slant range which initially precluded recognition. As the target size increased, subjects were asked to press a remote projector control button when they were virtually certain of the correct response. The results indicate little effect of percent active area (i.e., down to 55 percent on target recognition performance for element angular subtense values between 0.75 and 3.0 minutes of arc (corresponding to element densities of from approximately 165 to 40 elements per inch at a 28 inch viewing distance). The effects of element density, however, were large and conformed to expectations derived from the limiting resolution of the visual system. Geometric mathematical derivations are provided for the relationships between element density, viewing distance, target size, sensor field of view, total number of display elements and slant range at time of target recognition. (Author)

AD-A027 566/8GA PC$3.50/MF$3.00
Ohio State Univ Columbus Electroscience Lab
Measurement of the Power Handling Capability of a Biplanar Slot Array.
Technical rept. Mar 73-Dec 75,
C. J. Larson. Jun 76, 16p ESL-3622-9, AFAL-TR-76-58
Contract F33615-73-C-1173

Descriptors: *Radomes, *Power measurement, Aircraft antennas, Radar antennas, Slots, Metals, Breakdown(Electronic threshold), Radiofrequency power, Handling.
Identifiers: *Metallic radomes, Dielectric coatings, Biplanar slot arrays.

The subject of this report is the measurement of the power handling capability of a biplanar metallic radome. The radome, which is a double layer of slot arrays, is simulated by placing a small piece of the radome in a waveguide and using the images to simulate an infinite array. The power handling capability is determined by raising the incident power in the waveguide until the piece of radome breaks down. The incident breakdown power can be simply related to the breakdown power density of the array in free space. Biplanar radome surfaces able to handle power densities in excess of 4 megawatt sq m are demonstrated. The knowledge of the breakdown power density of the radome will aid the Air Force in designing airborne radar systems. (Author)

AD-A027 504/0GA PC$3.50/MF$3.00
Army Electronics Command Fort Monmouth N J
Insulated Subsurface Horizontal Wire Antennas at Shallow Depths; Dependence of Characteristic Parameters on Burial Depth.
Technical rept.,
F. Schwering. May 76, 20p Rept no. ECOM-4408

Descriptors: *Underground antennas, Capacitance, Transmission lines, Depth, Electrical insulation, Electrical resistance, Inductance, Protective coatings, Dielectric properties.
Identifiers: *Buried antennas, Near the earth horizontal wire antennas.

The characteristic parameters of near-the-earth horizontal wire antennas depend significantly on the height at which these antennas are suspended above ground. The question may be asked: Does a similar dependence on distance from the earth's surface exist for antennas buried at shallow depths. By using a transmission line approach, it is shown that variations of the input parameters are caused primarily by the height- or depth-dependence of the capacitance per-unit-length of the antenna wire. (In the case of a buried antenna, the wire is assumed to be insulated from the ground by a thick coat of a low-loss dielectric). The inductance and resistance per unit-length, on the other hand, are approximately constant in the range of low heights above ground to shallow burial depths. It is furthermore concluded that the capacitance per-unit-length of a subsurface antenna is also nearly constant as long as the antenna remains at a sufficient distance from the earth's surface. Hence, little variation of the input parameters should be expected in the range of small burial depths. The rather rapid variation of these parameters will commence only when the antenna is at such shallow depths that its capacitance per-unit-length is significantly affected by the presence of the air-earth interface. This variation continues as the antenna is thought to be raised out of the ground and into the air half-space. (Author)

AD-A027 506/5GA PC$5.00/MF$3.00
Ohio State Univ Columbus Electroscience Lab
Analysis of a Conformal Receiving Array of Slots in a Perfectly-Conducting Circular Cylinder by the Geometrical Theory of Diffraction.
Technical rept.,
P. H. Pathak. Jan 75, 98p Rept no. ESL-3735-2
Contract N00140-74-C-6017

Descriptors: *Conformal structures, *Antenna arrays, *Slot antennas, Cylindrical bodies, Direction finding, Diffraction, Admittance, Matrix theory, Electromagnetic radiation, Short circuits.

This report deals with an analysis of the voltages received by a conformal array of rectangular slots in a circular cylinder when it is illuminated by an electromagnetic plane wave. The received voltages are calculated via an admittance matrix formulation; this formulation requires a knowledge of the array admittance matrix whose elements contain the external aperture self and mutual admittances, respectively, and a matrix whose elements contain the short circuit modal currents induced in the slot apertures by the incoming plane wave. The induced short circuit currents and the external mutual admittances are very simply and accurately found via the geometrical theory of diffraction (GTD). Even though the GTD is a high frequency method, the GTD results employed herein are expected to be quite accurate for cylinders as small as three wavelengths in circumference. The analysis given in this report is based on the dominant mode approximation for the electric field in the slot apertures. Numerical results are presented for the voltages received by a three or four element slot array as a function of the angle of arrival (in azimuth) of the incoming plane wave. Axial, circumferential and inclined (45 deg) slot arrays are considered. It appears that such an array of slots in a cylinder can be effectively employed for the purposes of direction finding. (Author)

AD-B000 216/2GA PC$4.50/MF$3.00
Naval Electronics Lab Center San Diego Calif
Thin-Wire Modeling Techniques Applied to Antenna Analysis.
Technical document,
J. W. Rockway, and J. C. Logan. 11 Oct 74, 57p Rept no. NELC-TD-359
Distribution limitation now removed.

Descriptors: (*Antennas, Mathematical models), Wire, Electromagnetic radiation, Loop antennas, Computer programs, Coding, High frequency, Hydrofoils, Near field, Whip antennas, Frequency response, Helixes.
Identifiers: AN/PRC-104, DE 1041 Vessel, Miniloop Antennas, Multiturn.

This document is a summary of work performed in applying thin-wire modeling techniques in support of antenna analysis at NELC during FY74. Detailed discussion is limited to aspects which show how numerical modeling has contributed to an engineering solution. References cited throughout the document provide a source for more complete coverage of a given subject. The first part is intended as an introduction for the uninitiated reader but may prove informative also to those using the same computer codes. The second part describes how thin-wire modeling has been applied to several engineering problems. Thin-wire modeling is demonstrated to be a useful engineering tool in problems involving determination of current distribution, impedance, near- and far-field electric and magnetic components, and efficiency. Listings of the specialized subroutines added by NELC to the AMP program are appended. (Author)

AD-B001 803/6GA PC$4.00/MF$3.00
Rca Labs Princeton N J
Basic Adhesion Mechanisms in Thick and Thin Films.
Quarterly technical rept. no. 1, 1 Jan-31 Mar 74,
Thomas T. Hitch, and Kenneth R. Bube. 30 Apr 74, 40p Rept no. PRRL-74-CR-29
Contract N00019-74-C-0270
Distribution limitation now removed.

Descriptors: (*Thick films, *Adhesion), (*Thin films, *Adhesion), (*Microcircuits, Metallizing), Reliability, Circuit interconnections, Gold, Powders, Nondestructive testing, Destructive tests, Substrates, Inks, Manufacturing, Microstructure, Bonding.

This report briefly reviews the present understanding of adhesion fundamentals and methods of adhesion testing for thick- and thin-film conductors. It does this with a view to the need for military electronic circuitry with built-in reliability. The study concentrates on gold thick-film conductors and destructive and nondestructive adhesion test methods for thick-film conductors. It addresses the effects of sub-

strate character, ink formulation, and circuit manufacturing processes upon film microstructures and, hence, properties of commercial and model thick-film materials. Twenty commercial gold conductors are under initial investigation; preliminary analyses of ten of these inks are presented. Alumina of 96 and 99.5 wt pct purities will be used as substrates in the study of commercial and model inks. Gold metal powders described in this report will be used in the formulation and testing of the model conductor inks. Plans for continuation of the above study and for additional work are outlined. (Author)

AD-B001 804/4GA PC$4.50/MF$3.00
Rca Labs Princeton N J
Basic Adhesion Mechanisms in Thick and Thin Films.
Quarterly technical rept. no. 2, 1 Apr-30 Jun 74,
Thomas T. Hitch, and Kenneth R. Bube. 31 Jul 74, 73p Rept no. PRRL-74-CR-54
Contract N00019-74-C-0270
Distribution limitation now removed.

Descriptors: (*Thick films, *Metallizing), (*Gold, inks), (*Hybrid circuits, Microcircuits), (*Alumina, Substrates), (*Thin films, Adhesion), Ceramic materials, Bonding, Electrical conductivity, Electrical resistance, Powder metals, Peel strength, Sheets, Microstructure, Electron microscopy, Electronic scanners, Chemical analysis, Sintering, Manufacturing, State of the art.

During this quarter, an historical overview of ceramic metallization was undertaken. This included a review of the applications of the technology prior to its utilization in hybrid microcircuits per se. The existing metal-to-ceramic bonding concepts were examined. Appropriate sintering models will be utilized in studying the fundamental aspects of gold thickfilm adhesion in the next quarter. The inorganic chemical analyses of 17 commercial inks were completed. The microstructures of unfired inks have been examined by scanning electron microscopy and have disclosed gold in spherical and hexagonal-triangular platelet form. In addition, the physical and electrical properties of the 17 inks have been characterized on 96 and 99.5 wt pct alumina substrates. This primary parametric study included a ranking of ink performance in terms of printing resolution, adhesion strength (via the peel test method), and electric sheet resistance. In terms of absolute failure load, one reactively bonded gold film exceeded that of all frit-bonded systems. This advantage was maintained even after multiple firing of the film and can be an important property in complex multilevel circuit applications. The lowest sheet resistance, approximately 2 milliohms/square was found in a spherical gold powder-based frit-bonded ink.

AD-B006 333/9GA PC$4.00/MF$3.00
Naval Electronics Lab Center San Diego Calif
Multifrequency Arrays: Design and Cost Considerations.
Research and development rept. 3 Mar 69-2 Jul 75,
J. H. Provencher, G. Vaughn, D. Proctor, and J. E. Boyns. 8 Jul 75, 45p Rept no. NELC/TR-1956
Distribution limitation now removed.

Descriptors: (*Phased arrays, Hydrofoil craft), Cost analysis, Phase shift circuits, Gain, Arrays, Costs, Weight, Lightweight, Errors, Search radar, Radar tracking, Extremely high frequency, Integrated circuits, Wavelengths.
Identifiers: Design, Multifrequency, Multiband antennas.

This report describes several multiband antenna techniques and a method of cost analysis for array antennas. A concept is given which has potential to reduce overall array costs for large phased array systems by using component commonality to propagate several frequency bands. Techniques which can be used to reduce the cost, weight, and complexity of phased arrays are given, as well as potential applications for these techniques on small craft such as the hydrofoil. (Author)

AD-921 792/8GA PC$5.50/MF$3.00
American Electronic Labs Inc Colmar PA
Basic Circuit Modules.
Quarterly progress rept. no. 7, 1 Apr-1 Jul 73,
J. Klepchick, L. Resinski, and G. Thompson. Apr 74, 108p 10790-7, ECOM-0339-7-71
Contract DAAB07-71-C-0339
Distribution limitation now removed.

Descriptors: (*Electromagnetic interference, Measurement), (*Receivers, Modular construction), Modules(Electronics), Circuits, Breadboard models, Intermediate frequency amplifiers, Voltage, Wave analyzers, Interfaces, Phase locked systems, Feedback, Voltage controlled oscillators, Scalers, Counters, Phase measurement, Low pass filters, High pass filters, Digital to analog converters, Medium frequency, K band, Superlow frequency, Extremely high frequency.
Identifiers: Local oscillators, A band.

The Basic Circuit Modules program objective is to produce a design for a modular EMI measurement system. The program was divided into two parts. Phase I, which has been completed, was a study program to produce a design of the entire measurement system. Phase II has been directed toward producing a breadboard model of a portion of the system designed during Phase I. This report describes progress during the third quarter of the Phase II program. Test and evaluation of some of the modules used in the system were performed during this past quarter. The items evaluated included voltage controlled preselectors, portions of the IF module, digital to analog interface circuitry in the control system, a true RMS measurement system, and a phase-locked loop to stabilize the system LO source. Also defined were packaging formats for the control system and an amplitude distribution measurement system described in an earlier report. The remaining part of the program will be directed toward system testing and evaluation. (Author)

AD-921 971/9GA PC$6.00/MF$3.00
American Electronic Labs Inc Colmar PA
Basic Circuit Modules.
Final rept. 1 Jul 73-Jan 74,
D. Legower, and L. Resinski. Jun 74, 140p 10790, ECOM-71-0339-F
Contract DAAB07-71-C-0339
Distribution limitation now removed.

Descriptors: (*Circuits, *Modules(Electronics)), (*Electromagnetic interference, *Interference analyzers), Breadboard models, Measurement, Intermediate frequencies, Modular construction, Modulation, Specifications, Field tests, Varactor diodes, Electrical properties, Environmental tests, Bandwidth, Gain.
Identifiers: Local oscillators.

The Basic Circuit Modules program objective has been to produce a design and a breadboard model of a modular EMI measurement system. The program was divided into two parts; Phase I, was a study program to produce a design of the entire measurement system covering a frequency range of 30 Hz to 40 GHz. The Phase II portion of the program has been directed toward producing a breadboard model of a portion of the designed during Phase I. This report is the final report. A description of the activity during the final quarter and a summary of earlier progress is included. Test and evaluation of the complete measurement system is described, as well as the results gathered in the evaluation of the Amplitude Distribution Processor, a new measurement technique designed during Phase I. Tests on the measurement system included both module and system evaluation. Laboratory tests and field evaluation were performed on both the measurement system and the Amplitude Distribution Processor. (Author)

N76-25316/0GA PC$4.00/MF$3.00
McDonnell-Douglas Technical Services Co., Inc., Houston, Tex. Astronautics Div.
Multiple Dielectric Layer Effects on the Space Shuttle Orbiter S-Band Quad Antennas.
J. F. Lindsey. 20 Jan 76, 41p NASA-CR-147771
Contract NAS9-13970

Descriptors: *Antenna radiation patterns, *Dielectrics, *Radar antennas, *Space shuttle orbiters, Mathematical models, Optical reflection, Ray tracing, Superhigh frequencies.

For abstract, see STAR 1416

N76-25450/7GA PC$7.75/MF$3.00
Ohio State Univ., Columbus. Dept. of Electrical Engineering.
Analysis of Aircraft Wing-Mounted Antenna Patterns.
R. J. Marhefka. Jun 76, 217p NASA-CR-148199, TR-2902-25
Contract NGL-36-008-138

Descriptors: *Aircraft antennas, *Antenna radiation patterns, Elliptical cylinders, Flat plates, Antenna design, Performance tests, Position (Location), Volumetric analysis.

For abstract, see STAR 1416

N76-25452/3GA PC$5.50/MF$3.00
Alpha Industries, Inc., Woburn, Mass.
Dual Frequency Feed System for the Cts Communications Link Characterization Experiment.
Final Report, 23 May - 31 Dec. 1975.
G. J. Gill. Jan 76, 105p NASA-CR-144755, REPT-77-101
Contract NAS5-22398

Descriptors: *Data links, *Feed systems, *Radio receivers, Cassegrain antennas, Graphs (Charts), Polarization (Waves), Tables (Data).

For abstract, see STAR 1416

N76-25480/4GA Not available NTIS
Atomic Energy of Canada Ltd., Chalk River (Ontario).
Development of Engineering Application Packages for Interactive Design of Electronic Systems.
R. R. Shah, and G. Yan. Jul 75, 9p AECL-5228, CONF-750577-1
Conf-Presented at the 4TH Man-Computer Commun. Conf., Ottawa, Canada, 26-27 May 1975.

Descriptors: *Computerized design, *Electronic equipment, *Electronic packaging, Circuit boards, Computer graphics, Microelectronics, Printed circuits.
Identifiers: Canada.

For abstract, see STAR 1416

N76-25809/4GA Not available NTIS
Joint Inst. for Nuclear Research, Dubna (USSR).
Time-to-Digital Converter of Integrated Circuits.
Y. M. Valuev, V. M. Grebenyuk, and V. G. Zinov. 1975, 12p JINR-P13-8890
Language in Russian.

Descriptors: *Data converters, Digital data, *Integrated circuits, Time, Data bases, Digital techniques, Registers (Computers).
Identifiers: USSR.

For abstract, see STAR 1416

PAT-APPL-677 191/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
An Electronically Variable Surface Acoustic Wave Phase Shifter.
Patent Application,
Kenneth L. Davis. Filed 15 Apr 76, 6p AD-D002 605/4
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Phase shift circuits, Acoustic waves, Surface waves, Velocity, Variations, Control, Phase control devices.
Identifiers: *Patent applications, Accoustic surface waves, PAT-CL-350-96.

The patent application relates to an electrically variable surface acoustic wave phase shifter including a substrate upon which a piezoelectric layer is deposited and separated therefrom by an insulating layer. An electrode is deposited on the piezoelectric layer and on the bottom of the substrate with an electrical dc bias applied onto the electrodes which causes a charge accumulation or a depletion region at the silicon surface. This charge accumulation or depletion region causes the boundary conditions to change therefore causing a phase change in an acoustical wave propagating along the layered silicon surface.

PAT-APPL-678 516/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
Metallic Grating Spatial Filter for Directional Beam Forming Antenna.
Patent Application,
Allen C. Schell. Filed 19 Apr 76, 12p AD-D002 623/7
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Spatial filtering, *Directional antennas, Beam forming, Sidelobes, Suppression, Gratings(Spectra), Dielectrics.
Identifiers: *Patent applications, PAT-CL-343-770.

The patent application relates to sidelobe suppression and other beam transmission property manipulations in directional beam forming antennas accomplished by means of a spatial filter. The filter geometry consists of a plurality of metallic gratings separated by air or other low dielectric constant dielectric substance. The filter is placed directly over the antenna radiating aperture. The shunt susceptance characteristics of the metallic gratings together with the integrating spacing distances are synthesized in a manner that effects full transmission of beam power in a selected beam direction while offering substantial rejection of it in other directions.

PAT-APPL-681 665/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Solid State Step Transmitter.
Patent Application,
Leon Bardin Crocker. Filed 27 Apr 76, 12p AD-D002 611/2
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Converters, *Signal processing, Digital systems, Pulse trains, Solid state electronics, Input output devices.
Identifiers: *Step transmitters, *Patent applications, PAT-CL-340-208.

The patent application relates to a solid state step transmitter which converts a low level asymmetrical square-wave voltage into a high level three-phase asymmetrical square-wave voltage, which is completely isolated from the input voltage and is one twenty-fourth of the input frequency. The output also has a positive and negative phase rotation selection.

PATENT-3 886 351 Not available NTIS
Department of the Navy Washington D C
Optical-to-Electronic Interface Circuit.
Patent,
Donald N. Williams. Filed 11 Mar 74, patented 27 May 75, 5p AD-D002 629/4, PAT-APPL-449 814
Supersedes AD-D000 458.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Optoelectronics, *Converters, *Patents, Digital systems, Interfaces, Circuits, Signal processing.
Identifiers: PAT-CL-250-206.

The patent describes an optical-to-electronic interface circuit for converting digital signal information in the form of light energy into commensurate digital electronic signals. A photoresponsive means is positioned to receive light signals for developing commensurate electrical signals. A first differential amplifier is connected to receive the electrical output signals as a first input and also a known fixed reference as a second input for generating first and second output signals having a differential thersbetween as a function of the differential between its received inputs. First and second unidirectional current paths connect the first and second output signals of the first differential amplifier as inputs to a second differential amplifier. A differential comparator receives the output signals developed by the second differential amplifier for generating a signal as a function of the difference between its received signals.

PATENT-3 916 416 Not available NTIS
Department of the Navy Washington D C
360 Degrees Azimuth Scanning Antenna Without Rotating RF Joints.
Patent,
Bernard L. Lewis. Filed 24 Sep 74, patented 28 Oct 75, 12p AD-D002 632/8, PAT-APPL-508 777
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Radar antennas, *Patents, Radar scanning, Beam forming, Focusing, Mechanical scanning, Reflectors, Rotation.
Identifiers: PAT-CL-343-756.

The patent describes a 360 degree scanning radar antenna which has a plurality of primary focusing-structures arranged in a circular fashion illuminating corresponding secondary focusing-structures which in turn are arranged about, and directed toward, a rotating multisided half-wave plane reflector. Radar energy is switched to radiate from a given primary focusing-structure during the time when the plane reflector is in position to reflect all of the energy collimated by the corresponding secondary focusing-structure. The secondary focusing-structure may be made to appear transparent to the beam reflected by the plane reflector.

PATENT-3 931 550 Not available NTIS
Department of the Navy Washington D C
Electronic Latching Relay Control.
Patent,
Joseph A. Dalpee. Filed 25 Nov 74, patented 6 Jan 76, 5p AD-D002 647/6, PAT-APPL-526 999
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Switching circuits, *Patents, Relays, Logic circuits, Flip flop circuits, Electronic switching, Electronic switches.
Identifiers: PAT-CL-317-148.5.

The patent describes a switching circuit which functionally performs as a double-throw latching relay controllable by a unipolar control pulse transmitted on only one control line (in addition to a ground line). Each control pulse triggers a change in state of a bistable device utilized in conjunction with logic circuitry. The logic circuitry controls the state of output driving devices. An associated voltage actuated device may be coupled to the outputs of the output driving devices.

PATENT-3 931 586 Not available NTIS
Department of the Navy Washington D C
Scanning Oscillator Stabilization.
Patent,
Ralph A. Carpenter. Filed 21 Mar 75, patented 6 Jan 76, 7p AD-D002 648/4, PAT-APPL-560 747
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Signal generators, *Patents, Scanning, Stabilization, Control systems, Linear systems, Error analysis.
Identifiers: PAT-CL-331-1.

The patent relates to the linear accuracy of the output-signal frequency of a scanning oscillator maintained through monitoring the location in a shift register of a pulse whose position is indicative of the frequency error from a desired scanning oscillator output-signal frequency.

PATENT-3 935 381 Not available NTIS
Department of the Navy Washington D C
Electronic Solid State Sensor Image Size Control.
Patent,
Edward A. Petrocelli, and Anthony C. H. Louie. Filed 24 Jun 74, patented 27 Jan 76, 5p AD-D002 652/6, PAT-APPL-482 393
Supersedes AD-D001 224.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Read out techniques, *Television display systems, *Patents, Control systems, Solid state electronics, Images, Optoelectronics.
Identifiers: PAT-CL-178-7.1.

The patent relates to an electronic control system for changing the image size produced by solid state sensors such as the Reticon sensor array, charged coupled devices, etc. The image size is increased or decreased by varying the horizontal and vertical scanning rate with respect to standard TV timing. The scanning rate is controlled by controlling the frequency of the horizontal and vertical clock pulses applied to the solid state sensor.

PATENT-3 938 153 Not available NTIS
Department of the Navy Washington D C
Sidelobe Canceller System.
Patent,
Bernard L. Lewis, and Irwin D. Olin. Filed 16 Aug 74, patented 10 Feb 76, 7p AD-D002 660/9, PAT-APPL-499 260
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commis-

sioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Antenna lobes, *Signal processing, *Antijamming, *Patents, Radiofrequency interference, Cancellation, Radar antennas.
Identifiers: *Sidelobe reduction, PAT-CL-343-100.

The patent describes an improved side-lobe canceller system for reducing interference introduced into a signal receiving system from multiple interference sources. A first canceller loop associated with an auxiliary channel operates independently to decorrelate its auxiliary signal and the output sample of a main channel signal from its own subtractor. Each of a remaining plurality of canceller loops, also associated with an auxiliary channel and operating independently, are serially connected to successively operate on the output of a previous canceller loop. When all auxiliary canceller loops have operated, a second series of the same canceller loops arranged to follow the first series, provides an additional iteration to the canceller system. By utilizing a plurality of serially arranged iterations to operate on the signals received by the plurality of auxiliary channels, the interference in the main channel may be significantly reduced. Used for radar antijamming.

PATENT-3 938 154 Not available NTIS
Department of the Navy Washington D C
Modified Sidelobe Canceller System.
Patent,
Bernard L. Lewis. Filed 16 Aug 74, patented 10 Feb 76, 7p AD-D002 661/7, PAT-APPL-499 374
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Antenna lobes, *Signal processing, *Antijamming, *Patents, Radiofrequency interference, Cancellation, Radar antennas.
Identifiers: *Sidelobe reduction, PAT-CL-343-100.

The patent describes an improved technique for eliminating interference in a signal processing system exposed to multiple interference sources. A main receiving channel output and a plurality of auxiliary channel outputs are connected to form a canceller system where outputs from the canceller of each auxiliary channel are connected in parallel and subtracted from the main channel signal. The output residue from the subtractor is then combined in a second subtractor with the input from a second group of parallel connected cancellers using the same auxiliary channels. Each group of parallel connected cancellers and subtractor forms an iteration which reduces the residue of interference in the main channel. By providing a series of iterations, the cancellation obtainable can be improved along with an increase in system stability. Used for radar antijamming.

PATENT-3 947 695 Not available NTIS
Department of Transportation, Washington, D.C.
Signal Conditioner Front-End.
Patent,
Phillip J. Silvia. Filed 21 Oct 74, patented 30 Mar 76, 5p PB-254 994/7, PAT-APPL-516 448
Supersedes PB-237 230.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Signal processing, *Coupling circuits, *Patents, Transducers, Excitation.
Identifiers: PAT-CL-307-85.

The patent relates to a means of providing signal conditioning, without degradation, for transducers having various excitation voltages prior to application to systems apparatus for further processing.

PB-255 445/9GA PC$5.00/MF$3.00
Little (Arthur D.), Inc., Cambridge, Mass.
Automated Integrated Circuit Processing and Assembly.
Final rept.,
H. Gunther Rudenberg. Apr 75, 86p* ADL-C-76842-F, NBS-GCR-76-64
Contracts NBS-4-35807, ARPA Order 2397

Descriptors: *Integrated circuits, *Automation, *Process control, Semiconductor devices, Wafers, Chips, Assembling, Processing, Trends.
Identifiers: Chips(Electronics).

The report describes the results of a study on automated procedures for integrated circuit (IC) processing and assembly by the semiconductor industry. Emphasis is on automated IC production, especially processing of wafers and assembly of chips into devices. Major operations that are already or may be automated are identified, and future directions are recommended. Information has been derived primarily from interviews in industry and analysis of automated production equipment. The report discusses the susceptibility of processes to automation: a major requirement for automation is that measurement and control techniques be available to provide consistent results from the processes chosen. The automation status of the key process steps is outlined, and the expected evolution to complete computer control is characterized. Measurement techniques reported are directed towards categories suitable for automation of production in respect to accuracy, range and type. The report cites economic and technical factors likely to inhibit automation in the future, and some factors favoring its adoption. A number of priorities for further action are presented.

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

N76-25650/2GA PC$12.50/MF$3.00
Scientific Translation Service, Santa Barbara, Calif.
Analysis of Technological Development Problems Posed by the Use of Orbital Systems for Energy Conversion and Transfer in and from Space.
Final Report.
D. Koehn, K. Jesche, J. Rath, D. Teichmann, and G. Wirths. Jun 76, 500p NASA-TT-F-16923
Contract NASW-2791
Tran-Transl. into English of Aeg Telefunken (Backnang), May 1975 502 p.

Descriptors: *Energy transfer, *Orbital assembly, Research and development, *Satellite solar energy conversion, *Space stations, Gallium, Microwave transmission, Optimization, Planotrons, Power plants, Solar arrays.
Identifiers: Translations.

For abstract, see STAR 1416

PB-254 683/6GA PC$4.50/MF$3.00
National Electrical Manufacturers Association, New York.
Total Energy Management: A Practical Handbook on Energy Conservation and Management.
Mar 76, 61p* FEA/D-76/325
Prepared in cooperation with National Electrical Contractors Association, Washington, D.C., and Enviro-Management and Research, Inc., Washington, D.C.

Descriptors: *Energy conservation, *Manuals, Buildings, Space heating, Air conditioning, Ventilation, Hot water heating, Illuminating, Electric appliances, Insulation, Handbooks.
Identifiers: Total energy management.

This handbook provides a practical approach for building owners and managers to implement energy conservation procedures and to use energy wisely. It allows businessmen to make knowledgeable judgments on where and how to conserve energy while maintaining optimum business activity. Total Energy Management (TEM) is an energy conservation approach based on the premise that to effect energy savings in buildings one must make the building's systems as efficient as possible. In this way, they will consume the smallest amount of energy to perform the functions required. By considering all elements of a building's system, one can recognize a great many areas where savings can be achieved. It provides owners and managers the flexibility required to conserve energy and cut costs while meeting the needs of the building's users at the same time.

PB-255 170/3GA PC$10.50/MF$3.00
Ernst and Ernst, Washington, D.C.
Review of Energy Forecasting Methodologies and Assumptions.
Final rept. on Topic 4.
Jun 76, 351p*
Contract DI-14-03-6101N
Prepared in conjunction with the BPA EIS entitled The Role of BPA in the Pacific Northwest Power Supply System, Including Its Participation in the Hydrothermal Power Program. See also PB-255 171.

Descriptors: *Energy models, Energy consumption, Electric power demand, Forecasting, Econometric models, Electric utilities.
Identifiers: Electric power consumption, Energy forecasts.

This report gives a systematic identification and description of energy forecasting methodologies used both within and outside of the Pacific Northwest; identification and comparative discussion of basic socioeconomic and other assumptions used in such forecasts, including discussions of how each varies, why variances occur, the potential effects of the variations on forecasting results, and reasons for including or excluding specific assumptions in the different forecast methodologies; and comparative discussion of interrelationships between electric energy forecasts, other energy forecasts, and non-energy forecasts presently in use in the Pacific Northwest.

PB-255 288/5GA PC$6.75/MF$3.00
Denver Federal Executive Board, Colo.
Proceedings of Regional Energy EIS Seminar, Held at Denver, Colorado on March 6-7, 1975.
Cooper H. Wayman. 1975, 174p

Descriptors: *Meetings, *Energy shortages, *Environmental impacts, Coal gasification, Strip mining, Oil shale, Nuclear power, Planning, Energy policy, Ecology, Social effect, Economic impact, Legislation, Regulations.

Because of the impetus of energy development projects in the Rocky Mountain area, a seminar was held in Denver, Colorado, on March 6-7, 1975, to address the multitude of environmental impacts (both on-site and off-site) that might result. The meeting was devoted to both technical and legal aspects of the problem. It specifically addressed problems in the energy-related environmental impact statement process.

Group 10A—Conversion Techniques

PB-255 287/5GA PC$7.75/MF$3.00
Northern Great Plains Resources Program, Denver, Colo.
Comprehensive Energy Accomplishment Plan II, FY-75. Appendix A.
1974, 202p
Prepared in cooperation with Environmental Protection Agency, Denver, Colo. Region VIII.

Descriptors: *Energy policy, *Coal mining, *Environmental impacts, Coal, Oil shale, Uranium, Crude oil, Natural gas, Geothermal resources, Hydroelectric power, Planning, Legislation, Regulations, Montana, Wyoming, North Dakota, South Dakota.
Identifiers: Northern Great Plains Region(United States), Energy resources.

This report presents a plan for a second phase of the allocation of EPA resources to carry out its responsibilities for evaluating coal mining and power generation in the Northern Great Plains area of Montana, the Dakotas, and Wyoming. Emphasis of the Plan is on Regionally-coordinated (Region VIII) efforts.

PB-255 351/9GA PC$7.50/MF$3.00
Urban Systems Research and Engineering, Inc., Cambridge, Mass.
Baseline Energy Forecasts and Analysis of Alternative Strategies for Airline Fuel Conservation.
Jul 76, 199p* FEA/D-76/026, , FEA/D-CP-48
Contract FEA-C-04-50088-00

Descriptors: *Energy conservation, *Air transportation, *Fuel consumption, Fuel management, Supply(Economics), Allocations, Airspeed, Velocity, Towing, Incentives, Prices, Policies, Forecasting, Noise pollution, Air pollution, Environmental impacts, Social effect, Economic impact.

To evaluate the impact of fuel conservation strategies, baseline forecasts of airline activity and energy consumption to 1990 were developed. Alternative policy options to reduce fuel consumption were identified and analyzed for three baseline levels of aviation activity within the framework of an aviation activity/energy consumption model. By combining the identified policy options, a strategy was developed to provide incentives for airline fuel conservation. Strategies and policy options were evaluated in terms of their impact on airline fuel conservation and the functioning of the airline industry as well as the associated social, environmental, and economic costs.

10B. Power Sources

AD-A027 547/9GA PC$3.50/MF$3.00
David Sarnoff Research Center Princeton N J
Application of Granular Semiconductors to Photothermal Conversion of Solar Energy.
J. I. Gittleman. 20 Nov 75, 4p AFOSR-TR-76-0672
Contract F44620-75-C-0057
Availability: Pub. in applied physics letters, v28 n7 p370-371, 1 Apr 76.

Descriptors: *Semiconductors, *Solar energy, Photothermal energy, Absorbers(Materials), Energy conversion, Reprints.
Identifiers: Germanium, Alumina, Aluminum, *Solar energy absorbers, Granules.

A novel selective solar absorber, consisting of a dispersion of semiconductor grains in a low-dielectric-constant insulator is proposed. Calculations based on Maxwell-Garnett theory show that because of its lower reflectivity for lamda < 1.5 micrometers this material is about 60%. more efficient than silicon in converting solar energy to heat. Reflectivity measurements for Ge-Al2O3 films on aluminum agree with the predictions of the Maxwell-Garnett theory. The problems associated with the reduction to practice are discussed. (Author)

AD-A027 654/3GA PC$4.50/MF$3.00
Stanford Univ Calif Dept of Mechanical Engineering
Abstracts: 1976 AFOSR Contractors' Meeting on MHD Power Generation and Lasers Held at Stanford University, Stanford, California on May 3-4, 1976.
4 May 76, 58p AFOSR-TR-76-0171
Contract F44620-76-C-0024

Descriptors: *Magnetohydrodynamic generators, *Laser beams, *Meetings, Electric power production, Plasmas(Physics), Electrodes, Combustion chambers.
Identifiers: Plasma instabilities.

The report consists of a collection of abstracts of the numerous research progress reports given by AFOSR contractors and of invited papers from other governmental agencies and contractors. These papers presented over a two-day period composed the 1976 annual contractors meeting on MHD electric power generation and lasers. The principal investigators and their organizational association are also identified.

N76-25655/1GA PC$4.00/MF$3.00
Arizona Univ., Tucson. Electrical Engineering Dept.
Optimization of Contaminated Oxide Inversion Layer Solar Cell.
Final Report.
R. L. Call. Apr 76, 32p NASA-CR-148150
Contract JPL-954189
Subm-Sponsored by NASA.

Descriptors: *Antireflection coatings, *Ion implantation, *P-n junctions, *Silicon oxides, *Solar cells, Energy conversion efficiency, Manufacturing, Photovoltaic conversion, Surface layers.
Identifiers: Solar energy conversion.

For abstract, see STAR 1416

PAT-APPL-676 018/6GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Projectile Power Generator.
Patent Application,
Wayne J. Hopkins. Filed 12 Apr 76, 11p AD-D002 603/9
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Electric generators, Electric fuzes(Ordnance), Projectile fuzes, Drives, Air flow.
Identifiers: *Patent applications, PAT-CL-102-70.2.

The patent application relates to a system for generating electrical power, comprising a stator in combination with an air driven turbine type rotor of annular shape and supported for rotation on an outer surface of the unit to which power is to be supplied. Aerodynamically responsive fins on the annulus ring, when exposed to the air flow, rotate the annulus. Magnets in the annulus are separated from stationary stator coils embedded in the unit to generate alternating current. The patent application relates to projectile fuses and more particularly to fuses having an air driven generator as the electrical power source.

PB-255 134/9GA PC$4.00/MF$3.00
Department of the Interior, Washington, D.C.
Interim Environmental Guidelines for Thermal Power Plant Site Evaluation-Pacific Northwest.
Jul 70, 27p

Descriptors: *Thermal power plants, *Site surveys, Guidelines, Planning, Washington(State), Oregon, Idaho, Montana, Wyoming, Environmental impacts.
Identifiers: *Pacific Northwest Region(United States), National Environmental Policy Act of 1969, Public Law 91-190.

These interim guidelines were prepared by the Department of the Interior agencies in the Pacific Northwest (Oregon, Washington, Idaho, and those parts of Montana and Wyoming west of the Continental Divide), to assist in evaluating the effects of thermal power plant site selection upon the aquatic and terrestrial environment within the scope of the Department's responsibilities.

10C. Energy Storage

AD-A027 779/7GA PC$10.75/MF$3.00
General Dynamics/Convair San Diego Calif
Silver-Zinc Battery Characteristic Report.
R. P. Mikkelson. Oct 66, 398p GDC-BGY66-007, SAMSO-TR-76-174
Contract AF 04(694)-240

Descriptors: *Launch vehicles, *Silver zinc batteries, Guided missile batteries, Failure(Electronics), Voltage, Electrolytes, Short circuits, Activation, Performance, Electric charge, Electrolytic cells, Potassium compounds, Hydroxides.
Identifiers: *Atlas launch vehicles, Atlas, Potassium hydroxide.

This test program was undertaken to determine the effect on performance of the manually activated type silver-zinc battery as a result of partial charges, cell shorts, improper filling, contaminated electrolyte, extended wet (activated) stand time, etc., because there had been no previous testing of this nature on this type battery. Two versions of silver zinc batteries currently in use at General Dynamics Convair on the Atlas missile space launch programs were selected for use in the test program. They were the Yardney 61302 battery (GD-C Part Number 69-06309-1) consisting of 19 PM30 type cells and the Power Sources 200994 battery (GD-C Part Number 69-06308-1) consisting of 19 cells assembled into three monoblocks.

PATENT-3 920 476 Not available NTIS
Department of the Navy Washington D C
Electrode Gap Control for Electro Chemical Batteries and Heat Generation Systems.
Patent,
Stanley A. Black, and Sergius S. Sergev. Filed 19 Sep 74, patented 18 Nov 75, 4p AD-D002 634/4, PAT-APPL-507 653
Supersedes AD-D001 465.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Heaters, *Sea water batteries, *Consumable electrode process, *Patents, Hydrogen, Gas generating systems, Control, Magnesium, Iron, Electrochemistry, Cathodes, Anodes, Buoyancy, Diver equipment.
Identifiers: *Magnesium iron cells, PAT-CL-136-100.

This invention is related to control of spacing between consumable electrodes in an electrochemical energy source. The electrochemical reaction between an active metal such as magnesium and a passive metal such as iron in an electrolyte such as seawater has been used for the production of electrical energy in seawater batteries and also for the production of heat in a magnesium seawater diver heater. The device disclosed herein offers a simple, reliable, and economical approach to maintaining a constant reaction rate, other parameters being constant, in electrochemical batteries, heaters, or hydrogen generators which use a consumable anode and inert cathode immersed in a liquid electrolyte. The spacing control rate can

be preset to adust for other cell parameters which might influence cell output over a period of time.

PB-255 549/8GA PC$4.00/MF$3.00
California Univ., Los Angeles. School of Engineering and Applied Science.
Preparation and Properties of Beta-Alumina/Glass Composites.
Final rept.,
John D. Mackenzie. Jun 76, 44p EPRI/EM-181

Descriptors: *Solid electrolytes, *Sodium sulfur batteries, *Composite materials, *Electric batteries, Glass, Aluminum oxide, Fabrication, Bonding, Reliability(Electronics).
Identifiers: Glass bonded composites, Aluminum oxide matrix composites.

The purpose of project 254-1 was to fabricate glass-bonded beta-alumina composites for use in Na-S batteries. Samples were prepared by hot pressing various ionically conducting glasses with beta-alumina powders. The glassy phase served as a binder between the beta-alumina grains. Most of the binders, however, reacted with the beta-alumina and a new crystalline phase was formed. Altering the processing conditions either enhanced or reduced the amount of reaction and influenced the electrical properties accordingly. These composites had beta-alumina as the continuous phase but their conductivities were lower than anticipated. Additional experiments were performed in order to determine the transport mechanisms. It appears that transport in these composites is controlled by sodium ion migration through the beta-alumina. The larger than predicted resistivities were thought to arise from poor contact between beta-alumina grains, where a large interparticle resistance severely hampers conduction.

11. MATERIALS

11A. Adhesives and Seals

AD-A027 178/3GA PC$9.00/MF$3.00
Goodyear Tire and Rubber Co Ariz Aviation Products Div
Fuel Cell Ballistic Repair and Fitting Replacement.
Final technical rept. Jul 72-Aug 74,
S. G. Young. Nov 74, 265p Rept no. CDR-235
Contract DAAJ01-73-C-0002

Descriptors: *Self sealing fuel tanks, Repair, Fittings, Ammunition damage, Sealing compounds, *Helicopters, Replacement, Maintenance, Composite materials.

This document presents all data resulting from a three-phase program conducted to develop and evaluate materials and procedures for the field repair of ballistically damaged crashworthy, self-sealing fuel cells. The initial phase involved establishing both ballistic repair and fitting replacement procedures, and the repair materials to be used. The evaluation was made using both cube cells and panels of cell material containing replaced fittings. The second phase involved three cube cells that were mechanically wounded, repaired, and ballistically tested to establish size, proximity, location, and number of wounds that could feasibly be repaired. All wounds were 3-1/4-inch knife slits; the minimum distance between wounds was 2 inches; and the maximum number of wounds in any 30-inch x 30-inch cube face was 8. The third phase involved the use of full-scale crashworthy, self-sealing fuel cells. All cells were ballistically wounded, subjected to a post-gunfire fuel soak, repaired, and crash impacted. The cells utilized were a UH-1D/H, upper L.H.; a UH-1C, L.H.; a CH-47C, auxiliary; and an OH-58. The UH-1D/H and OH-58 cells passed the crash impact test, while the UH-1C and CH-47C cells did not. It was concluded that the repair procedure and repair cement would restore the crashworthy integrity of the ballistically wounded UH-1D/H and OH-58 fuel cells. It was further concluded that the crashworthy integrity of the larger UH-1C, L.H., and CH-47C fuel cells would not be restored using the repair cement.

AD-B004 618/5GA PC$8.00/MF$3.00
Texas Instruments Inc Dallas
Investigation of Microcircuit Seal Testing.
Final technical rept. Feb 73-Aug 74,
Sam B. Banks, Ralph E. McCullough, and E. Gerow Roberts. Apr 75, 239p TI-03-74-14, RADC-TR-75-89
Contract F30602-73-C-0150
Distribution limitation now removed.

Descriptors: (*Leak detectors, Specifications), (*Hermetic seals, Test methods), (*Microcircuits, Leakage(Fluid)), Krypton, Radioactive isotopes, Sensitivity, Dynamic range, Helium, Dynamic range, Helium, Military requirements, Tracer studies, Pressure, Getters, Bubbles, Metal oxide semiconductors, Glass.
Identifiers: *Helium leak detectors.

The purpose of this investigation was to determine the detection ranges of Test Conditions A, B, C, and E of Method 1014, MIL-STD-883. Also to examine the test variables and modifications of the methods for possible expansion of the detection ranges, and to improve the overall test results. This report discusses the various tests conducted and the results of these tests. In addition to the standard test conditions, various exposure pressures and times of both helium and radioisotope tracer gases are examined. Surface absorption, gettering materials, and controlled orifice helium testing are each examined and discussed. Also the gross leak bubble and weight gain test methods are evaluated for sensitivity and effectiveness using various pressures, pressurization times, and fluids for the purpose of optimizing test conditions and defining reject criteria. Based on the data analysis of this testing, recommendations of leak rate limits and parameter conditions are made which will provide the highest degree of reliability in the most cost-effective manner. (Author)

PAT-APPL-877 182/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
A Method for Closing Elastomeric Tubes in the Walls of Fluid-Filled Vessels.
Patent Application,
Anthony J. Rudgers. Filed 15 Apr 76, 9p AD-D002 604/7
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Tubes, *Closures, Inserts, O rings, Elastomers, Containers, Leakage(Fluid), Seals.
Identifiers: *Patent applications, PAT-CL-215-47.

The patent application relates to a technique for effectively closing elastomeric tubes that connect the interior of a fluid-filled vessel with the space exterior to the vessel. Thus fluid interior to the vessel cannot leak through the closure from the vessel into the exterior space nor can fluid exterior to the vessel leak through the closure into the vessel's interior.

11B. Ceramics, Refractories, and Glasses

AD-A027 169/2GA PC$4.00/MF$3.00
Ceramic Finishing Co State College Pa
Localized Impact Damage in Ceramics. A. Localized Impact Damage in Glass. B. Localized Impact Damage in Stressed Members.
Technical rept.,
Henry P. Kirchner, and Robert M. Gruver. Jun 76, 43p Rept no. TR-4
Contract N00014-74-C-0241

Descriptors: *Glass, *Impact, Damage, Erosion, Cracks, Penetration, Cracking(Fracturing), Residual, Strength(General), Stresses, Steel, Nylon, Test methods, Damage assessment, Particles, Spheres, Rain erosion.
Identifiers: Impact tests.

This technical report discusses (1) Localized Impact Damage in Glass -- Glass plates were impacted by glass, steel and NYLON spheres at velocities up to 115 m/s. The impact sites were characterized and the remaining strengths were measured. Hertz cone crack depths were found to be much less than theoretical estimates. The cone angles increased with increasing impact velocity. Evidence of crack branching of cone cracks, and radial and lateral vent crack formation was observed at high impact velocities. (2) Localized Impact Damage in Stressed Members Glass plates were stressed biaxially in flexure and impacted by glass spheres. The impact sites were characterized -- Impacts on tensile surfaces initiated damage at lower velocities and showed enhanced penetration compared with those on compressive surfaces. (Author)

AD-A027 357/3GA PC$5.50/MF$3.00
TRW Inc Cleveland Ohio
Nondestructive Evaluation of Ceramics.
Final technical rept. 20 Jan 75-19 Apr 76,
T. Derkacs, I. M. Matay, and W. D. Brentnall. 19 May 76, 124p Rept no. TRW-ER-7798-F
Contract N00019-75-C-0238

Descriptors: *Gas turbines, *Ultrasonic tests, *Silicon carbides, *Silicon nitrides, Nondestructive testing, High frequency, Ultrasonics, Flexural strength, Hot pressing, Defects(Materials), Fracture(Mechanics), Bonding, Sintering.
Identifiers: *Refractory materials.

An ultrasonic nondestructive evaluation (UNDE) techniques was developed to successfully detect small defects in gas turbine quality ceramic materials. A high frequency (25-45 MHz), longitudinal wave mode, pulse-reflection UNDE method was developed to evaluate a range of densities (2.2 to 3.2 g/cc) of ceramics (reaction bonded Si3N4, sintered SiC, hot pressed Si3N4 and hot pressed SiC) for various types of defects (open pores and seeded inclusions of low (Al2O3) and high (WC) densities) of various small sizes (10 to 130 micrometers). Conventional mechanical tests were also performed to verify defect sizes and to correlate material strength with UNDE results. (Author)

AD-A027 661/8GA PC$4.00/MF$3.00
Rome Air Development Center Griffiss AFB N Y
Microwave Cavity Diagnostics of CO2 Laser Effects on the Dielectric Properties of Select Materials,
K. V. N. Rao. May 76, 35p Rept no. RADC-TR-76-163

Descriptors: *Dielectrics, *Ceramic materials, Carbon dioxide lasers, Microwaves, Cavities, Diagnosis(General), Glass, Radomes, Silica glass, Silicon nitrides, *Laser target interactions, Slip casting.
Identifiers: Dielectric materials, Dielectric constant, Pyroceram, Cordopreg, *Radiation effects, Infrared lasers.

A variety of dielectric samples such as Cordopreg (E293), Slip-Cast Fused Silica (SCFS), Impregnated Slip-Cast Fused Silica (ISCFS), Pyroceram (Corning 9606), Silicon Nitride (SN), and Impregnated Silicon Nitride (ISN) were in-

dividually placed in a microwave cavity resonating approximately at 6 GHz in the TE111 mode. These samples are irradiated by a cw, 10.6 micron laser beam for less than 5 sec and with a power density up to 1000 w/sq cm. the complex permittivity of the samples was determined during and after irradiation by standard microwave cavity perturbation techniques. The technique is found to be a sensitive method to measure small and rapid changes of the loss tangent of the dielectric. The sensitivity is dependent on the quality factor of the cavity and the rapidity of detection is limited by how fast the sweep oscillator can be swept through the resonance. Microwave absorptivity of all samples increased during laser irradiation for intensities greater than 60 w/sq cm. cordopreg has shown considerable mechanical, electrical and physical damage both during and after laser irradiation. Considerable specular reflection of laser radiation was observed from silicon nitride and impregnated silicon nitride samples. (Author)

AD-A027 698/9GA PC$4.00/MF$3.00
Battelle Columbus Labs Ohio
Fracture Stress as Related to Flaw and Fracture Mirror Sizes in Two Polycrystalline Ceramics.
Technical rept. Oct 75-Apr 76,
Girraj K. Bansal, and Winston H. Duckworth.
May 76, 42p Rept no. TR-5
Contract N00014-73-C-0408

Descriptors: *Fracture(Mechanics), Fractography, *Ceramic materials, *Brittleness, Polycrystalline, Defects(Materials), Cracks, Cracking(Fracturing), Crack propagation, Constants, Glass, Alumina, Sizes(Dimensions).
Identifiers: Stress intensity factors.

Fractographically observed critical-flaw boundaries in strength-tested specimens of two polycrystalline ceramics were used in calculating critical stress-intensity factors. Each ceramic was found to exhibit a characteristic stress-intensity factor (K sub IC) having little or no dependence on critical-flaw characteristics. Also, the research indicated that microstructural inhomogenities (e.g., large grains or pores) which initiate fracturing can be significantly smaller than associated critical flaws. The fractographic interpretations of critical-flaw boundaries were supported by independent determinations of K sub IC using artificially precracked specimens and by analyses both of fracture-mirror sizes and of water-enhanced sub-critical crack growth data. The fracture-mirror analysis further indicated that the parameter, A K sub IC, where A is the fracture-mirror constant, is a dimensionless, material-independent constant that can be evaluated solely from fractographic observations. (Author)

11C. Coating, Colorants, and Finishes

AD-A027 556/9GA PC$3.50/MF$3.00
Harry Diamond Labs Adelphi Md
Water-Vapor-Barrier Coatings for Polyurethane Foams.
Technical memo.,
J. Michael Boyd, and David Van Daalen. Jun 76,
14p Rept no. HDL-TM-76-14

Descriptors: *Protective coatings, *Polyurethane resins, *Water vapor, Polyethers, Moisture, Humidity, Foam, Butyl rubber, Epoxy resins, Insulation.
Identifiers: Vapor barriers.

The water-vapor transmission rates through a polyether type of polyurethane foam with and without vapor-barrier coatings were determined at 70 C and 91-percent relative humidity. The data indicate that polyurethane foam encapsulation cannot provide satisfactory protection from moisture penetration. The moisture transmission is more severe for low-density foam. Two low-molecular-weight, butyl-rubber coating materials and one epoxy compound were shown to form good coatings on the foam and resulted in 37- to 95-percent transmission-rate reductions when the coatings were nominally 0.020 in. thick. (Author)

11D. Composite Materials

AD-A027 154/4GA PC$7.50/MF$3.00
Alabama Univ in Huntsville Dept of Mechanical Engineering
Static and Dynamic Analysis of Thermoviscoelastoplastic Fiber-Reinforced Composite Shells in Missile Structures.
Final rept 1975-1976,
T. J. Chung, and R. L. Eidson. May 76, 185p
Rept no. UAH-RR-182
Contract DAAH01-72-C-0281

Descriptors: *Fiber reinforced composites, *Viscoelasticity, *Shells(Structural forms), *Rocket engine cases, Anisotropy, Elastic properties, Plastic properties, Thermal properties, Epoxy resins, Glass fibers, Kinematics, Hardening, Yield strength, Orientation(Direction), Computerized simulation, Numerical analysis, Finite element analysis, Mathematical prediction, Guided missile components.
Identifiers: *Kinematic hardening, Fiberglass reinforced plastics, Epoxy matrix composites.

It has been postulated that anisotropic structures such as the fiber composites should be governed by kinematic hardening. The final phase of this research therefore, was undertaken to investigate the feasibility of incorporating the changes of degrees of anisotropy during the post-yielding deformations. The present report describes the development of kinematic plastic function theory, the first of its kind ever used for the analysis of fiber composites. The method requires a considerable amount of computing time, but upon careful reprogramming, it is believed to be a powerful tool in the analysis of missile structures.

AD-A027 703/8GA PC$3.50/MF$3.00
Tel-Aviv Univ (Israel) School of Engineering
Vibration Analysis of Viscoelastic Bodies with Small Loss Tangents.
Zvi Hashin. Apr 76, 22p TAU-SOE/340-76,
Scientific-4, AFOSR-TR-76-0830
Grant AF-AFOSR-2591-74

Descriptors: *Viscoelasticity, *Composite materials, Vibration, Frequency, Amplitude, Peak values, Quantum theory, Israel.
Identifiers: Correspondence principle.

The correspondence principle for vibrations of viscoelastic bodies is specialized to the case of small loss tangents, resulting in considerable simplification: analytical evaluation of oscillatory fields is greatly simplified: peak frequencies and peak amplitudes under forced vibrations can be simply and directly determined; numerical solution of viscoelastic vibration problems becomes no more complicated than that of elastic problems. Similar simplifications result for computation of real and imaginary parts of effective complex moduli of composite materials. (Author)

N76-25353/3GA PC$4.50/MF$3.00
TRW, Inc., Cleveland, Ohio.
Tungsten Wire-Nickel Base Alloy Composite Development.
Contractor Report, 1 Jun. 1974 - 29 Feb. 1976.
W. D. Brentnall, and D. J. Moracz. Mar 76, 61p
NASA-CR-135021, ER-7849
Contract NAS3-17816

Descriptors: *Composite materials, *Nickel alloys, *Tungsten, Metal fibers, Optimization, Thermal fatigue.
Identifiers: Fabrication, Metal matrix composites, Tungsten carbide reinforced composites, Hafnium carbide reinforced composites, Nickel alloy matrix composites.

For abstract, see STAR 1416

N76-25354/1GA PC$4.00/MF$3.00
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A Composite System Approach to Aircraft Cabin Fire Safety.
D. A. Kourtides, J. A. Parker, W. J. Gilwee, Jr., N. R. Lerner, and C. J. Hilado. Apr 76, 46p NASA-TM-X-73126, A-6555

Descriptors: *Aircraft compartments, *Aircraft hazards, *Composite materials, *Fire prevention, *Polymers, Flammability, Laminates, Thermogravimetry, Toxicity.
Identifiers: Pyrolysis.

For abstract, see STAR 1416

11F. Metallurgy and Metallography

AD-A027 192/4GA PC$4.00/MF$3.00
Watervliet Arsenal N Y
Stress, Strain, and Deflection in Cracked C-Shaped Specimens.
Technical rept.,
R. Fujczak, and J. Throop. Jul 76, 40p Rept no. WVT-TR-76025

Descriptors: *Fatigue(Mechanics), *Fracture(Mechanics), Crack propagation, Deflection, Stresses, Strain(Mechanics), Cylindrical bodies, High strength alloys, *Steel.
Identifiers: C shaped specimens.

Experimental strains and load-line deflections of C-shaped fracture-toughness test specimens are reported as functions of load and increasing crack depth. It is shown that the variation in strain at the outer surface may be used as an indicator of fatigue crack growth for evaluating the critical load in fracture toughness tests. The stresses and load-line deflections are compared with theoretical values calculated for the uncracked specimens. Their relation to the stress intensity factor of the cracked specimen is examined. (Author)

AD-A027 286/6GA PC$6.00/MF$3.00
California Univ Berkeley Dept of Mechanical Engineering
Theories on Flow and Fracture in Metalworking Processes. Part I. A Theory of Metal Flow in Axisymmetric Piercing and Extrusion. Part II. A Theory on Ductile Fracture in Metalworking Processes.
Final rept. Mar 75-Mar 76,
S. N. Shah, Shiro Kobayashi, and S. I. Oh. May 76, 134p AFML-TR-76-61
Contract F33615-75-C-5151

Descriptors: *Metalworking, *Fracture(Mechanics), *Plastic deformation, Mathematical models, Finite element analysis, Defects(Materials), Extrusion, Stress strain relations, Matrices(Mathematics).
Identifiers: Piercing, Upsetting.

The objective of this investigation was to establish theories on flow and fracture in order to apply workability theory to metalworking processes. It has been shown in the application to upsetting that the matrix method is a powerful tool for the analysis of metalworking deformation mechanics. In Part I the matrix method was refined by the use of a different linearization technique, and the area of its application was expanded through the introduction of a technique for effectively treating the non-deforming regions in the computation. The refined version of the method was then applied

to a non-steady-state process of axisymmetric piercing and a steady-state process of axisymmetric extrusion. In part II the deformation mode of void growth was re-examined, using the model proposed previously but with formulations for large elastic-plastic deformation. The results show that the nonuniform mode due to void interaction could reduce the fracture strain by several times, compared to the results based on uniform void growth. The results also lead to a question as to the effect of the void-free surface interaction on the stress and strain fields and possible nonsymmetric bifurcation mode.

AD-A027 347/4GA PC$3.50/MF$3.00
Naval Research Lab Washington D C
Helium Mobility and Bubble Formation in Type 316 Stainless Steel, Aluminum, and Vanadium,
F. A. Smidt, Jr., and A. G. Pieper. 1975, 17p
Availability: Pub. in American Society for Testing and Materials Special Technical Publication 570, p352-368 1975.

Descriptors: *Nuclear reactors, *Radiation damage, Helium, *Aluminum, *Vanadium, *Stainless steel, Embrittlement, Elastic scattering, Migration, Diffusion, Voids, Reprints.
Identifiers: Steel 316, Transmission electron microscopy.

Helium mobility and bubble formation have been studied in Type 316 stainless steel, aluminum, and vanadium by implanting helium with the Naval Research Laboratory (NRL) cyclotron and studying its motion during subsequent annealing experiments. A newly developed alpha-alpha elastic scattering technique was used to determine helium concentration profiles in the metals, and quantitative transmission electron microscopy was used to characterize the bubble populations. Bubbles reached visible size at about 0.65Tm and continued to grow by a surface diffusion controlled process of bubble migration. Helium loss from cold-worked material was found to be much greater than in annealed material. (Author)

AD-A027 471/2GA PC$3.50/MF$3.00
Georgia Inst of Tech Atlanta School of Chemical Engineering
The Effect of Order on the Low Cycle Fatigue Response of Cu3Au Single Crystals,
K. H. Chien, and E. A. Starke, Jr. 21 Jan 75, 13p
AFOSR-TR-76-0642
Grant AF-AFOSR-2615-74
Availability: Pub. in Acta Metallurgica, V23 p1173-1184 Oct 75.

Descriptors: *Fatigue(Mechanics), Metals, *Copper, Gold, Cyclic tests, Cracks, Deformation, Strain(Mechanics), Stress strain relations, Reprints.
Identifiers: *Copper alloys, Gold containing alloys, Single crystals, Order disorder transformations.

Fully ordered and disordered Cu3Au single crystals were cycled for fracture in tension-compression under strain control over a wide range of fatigue life. The fully ordered crystals exhibited an initial rapid fatigue hardening followed by softening. The disordered crystals showed continuous fatigue hardening until fracture. Fatigue hardening is interpreted by the unidirectional hardening concepts and softening by disordering. For both fully ordered and disordered crystals, deformation bands developed during fatigue hardening for all strain amplitudes investigated. Fatigue cracks were observed to initiate at the intersection of slip bands and deformation bands and then propagate along the deformation band boundaries. Order had little effect on the fracture mode and both fully ordered and disordered crystals showed ductile fracture features. (Author)

AD-A027 489/4GA PC$3.50/MF$3.00
Ohio State Univ Columbus Dept of Metallurgical Engineering
Surface Energy of Copper as a Function of Oxygen Activity,
C. E. Bauer, R. Speiser, and J. P. Hirth. 2 Apr 75, 7p AFOSR-TR-76-0636
Grant AF-AFOSR-2242-72
Availability: Pub. in Metallurgical Transactions A, v7A p75-79 Jan 76.

Descriptors: *Copper, *Surface energy, Oxygen, Oxides, Creep, Impurities, Strain rate, Thermodynamics, Reprints.
Identifiers: Copper oxides.

Surface energies of copper at 1027 C were determined as a function of oxygen fugacity. The value of the surface energy was 1.49 J sq. m below 10 to the minus 18th power N/sq. m oxygen and decreased linearly from 10 to the minus 18th power to 10 to the minus 11th power N/sq. m. The region of linear decrease fitted the Gibbs adsorption isotherm and gave a surface coverage of 0.24 monolayers of oxygen. The surface energy apparently increased with oxygen fugacity in the range from 10 to the minus 11th power to 10 to the minus 7th power N/sq. m, but this was associated with effects introduced by a precursor oxide on creep rate rather than a true effect on surface energy. (Author)

AD-A027 584/4GA PC$3.50/MF$3.00
Washington Univ Seattle Div of Metallurgical Engineering
Influence of Microstructural Features on the Dynamic Fracture Behavior of Some Iron-Base Materials,
H. Vora, and D. H. Polonis. 29 Sep 75, 12p ARO-11956.3-MS
Grant DAAG29-74-G-0108
Availability: Pub. in Materials Science and Engineering, 22 p51-60 1976.

Descriptors: *Iron alloys, Dynamic loads, *Steel, Microstructure, Cracks, *Iron, *Fracture(Mechanics), Grain size, Crack propagation, Stresses, Carbon, Electron microscopy, Reprints.

An exploding wire system has been used to examine the effects of microstructure on the dynamic fracture behavior of high purity iron, 0.2% C steel and free machining steels. Optical and scanning electron microscopy studies of the fractured specimens indicate that the dynamic loading response is strongly material dependent, being influenced by the grain size and the presence of brittle second phase particles. Predominantly intergranular microcracks are observed in pure iron specimens having grain sizes ranging from 40 to 200 microns, whereas transgranular microcracks are observed to initiate the fracture process in 0.2% C steel of varying microstructures. The degree of dynamic fracture increases with increasing grain size in 0.2% C steel containing ferrite - pearlite microstructures. The fracture characteristics of the various materials are compared and discussed in relation to the dynamic fracture behavior of steel subjected to other methods of loading.

AD-A027 866/9GA PC$3.50/MF$3.00
Pennsylvania Univ Philadelphia
History Dependence in the Cyclic Stress-Strain Response of Wavy Slip Materials,
C. Laird, J. M. Finney, A. Schwartzman, and R. de la Veaux. 1975, 8p ARO-9329.8-MC
Grants DAHC04-74-G-0026, NSF-GH-33633
Availability: Pub. in Jnl. of Testing and Evaluation, v3 n6 p435-441 1975.

Descriptors: *Copper, *Nickel, *Carbon steels, *Stress strain relations, Cyclic tests, Fatigue(Mechanics), Prestressing, Deformation, Reprints, Electron microscopy.
Identifiers: Plastic deformation.

A conflict exists as to whether the saturated flow stress of a wavy slip metal cycled at high plastic strain amplitudes depends on history or not. To resolve this, mechanical tests have been carried out on heavily cold-worked copper and the structures studied by transmission electron microscopy. It has been found that, for any material, there exists a prestrain (dependent on many testing and material factors) below which cyclic stress-strain response is history independent and above which it is dependent. For severe prestrains, the cycling is insufficient to balance the dislocation structures in the cell walls, and the cells are more angular and misoriented than those which occur in annealed metal subjected to strain cycling. (Author)

AD-A027 575/0GA PC$4.00/MF$3.00
Royal Armament Research and Development Establishment Fort Halstead (England)
Overheating Characteristics of Clean Gun Steels.
Technical rept.,
R. J. Lake. Dec 75, 28p RARDE-TR-13/75, DRIC-BR-50964

Descriptors: *Steel, *Guns, Heat treatment, *Sulfur, Forging, Mechanical properties, Toughness, Ductility, Thermal degradation, High temperature, Great Britain.

Low sulphur (0.005%) type D gun steels are found to suffer a reduction in toughness and ductility when heat treated at temperatures above 1200 C, but can be forged at temperatures up to 1325 C without loss of mechanical properties. Higher sulphur content steels have higher overheating temperatures. No satisfactory reheat treatment process to raise the toughness of an overheated D steel has been established. (Author)

AD-A027 855/0GA PC$4.00/MF$3.00
Technion - Israel Inst of Tech Haifa Material Mechanics Lab
Constitutive Equations for Cyclic Loading of Rate Dependent Materials.
Interim rept. 1974-1976,
S. R. Bodner, and Y. Partom. Apr 76, 34p MML-51, Scientific-9, AFOSR-TR-76-0772
Grant AF-AFOSR-2607-74
Also pub. as ISSN-0072-9310.

Descriptors: *Metals, *Plastic deformation, *Stress strain relations, *Fatigue(Mechanics), Viscoelasticity, Strain hardening, Mathematical analysis, Titanium, Cyclic tests, Israel.

The constitutive equations that have been developed by the authors to represent elastic-viscoplastic, strain-hardening materials have been modified to apply to changes in the direction of stressing. This modification involves altering the strain-hardening parameters with a change in the sign of the stress and also adding a linear viscosity term to the plastic deformation rate. These modifications are shown to have a physical basis and enable the constitutive equations to predict the general features of cyclic stress-strain behavior at various extensions rates and strain amplitudes including the tendency toward a limit cycle. An unusual feature of cyclic loading tests on some metals is a local concavity of the stress-strain curve which is predicable by these equations. Cyclic stress-strain curves were calculated for titanium for various conditions and compared to corresponding experimental results.

AD-A027 716/0GA PC$4.50/MF$3.00
Pratt and Whitney Aircraft East Hartford Conn
Boundary-Integral Equation Method for Elastic Fracture Mechanics Analysis.
Interim rept. 1 Apr 75-31 Mar 76,
T. A. Cruse, J. R. Osias, and R. B. Wilson. May 76, 66p PWA-5408, AFOSR-TR-76-0878
Contract F44620-74-C-0060

Descriptors: *Stress analysis, *Fracture(Mechanics), *Fatigue life, Boundary value problems, Integral equations, Finite element analysis, Crack propagation, Stiffness, Grain boundaries, Alloys, Gas turbines.
Identifiers: Stress intensity factor.

A method has been developed and evaluated for merging two dimensional boundary-integral equation and finite element stress analysis programs. A variational formulation has been obtained which provides an analytical basis for the study of different merging schemes. Extensive numerical results are presented which verify the applicability of the merged analyses to fracture mechanics problems. Numerical and experimental results are presented in the area of fatigue life prediction for gas turbine structures with surface or corner cracks to correlate previously developed three-dimensional fracture mechanics analysis methods.

AD-A027 719/4GA PC$4.00/MF$3.00
Aeronautical Research Associates of Princeton Inc N J
On Fatigue Crack Growth and a Study of Some of the Stress History Parameters Affecting Fatigue Life.
Final rept. 1 Jan-31 Dec 75,
John C. Houbolt. Mar 76, 27p ARAP-273, AFOSR-TR-76-0879
Contract F44620-75-C-0035

Descriptors: *Fatigue life, *Fracture(Mechanics), *Stress analysis, *Aluminum alloys, Crack propagation, Loads(Forces), Copper alloys, Mathematical analysis.
Identifiers: Aluminum alloy 2024.

The purpose of the study was to gain further insight of how structural fatigue life is influenced by various statistical properties of the applied load history. The main aim in the present study was to maintain careful control over the input parameters, such as the ratio of the maximum fluctuating stress to the rms value, or the zero crossing values associated with the load history and its time derivative. Control was also made over the initiation of crack growth. Loading of Aluminum alloy 2024 was composed of a constant mean load and a super-imposed fluctuating component. The fluctuating component was achieved through a combination use of several sine-wave generators. Prior to giving the results of the tests, some consideration is given to crack growth behavior and its analytic form. From this consideration, the basis for a generalized crack growth analysis is outlined.

NTIS/PS-76/0645/2GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Titanium and Titanium Alloy Creep (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
Mona F. Smith. Aug 76, 138p
Supersedes NTIS/PS-76/536.

Descriptors: *Bibliographies, *Titanium, *Titanium alloys, *Creep, Abstracts, Stress corrosion, Fractures(Materials), Crack propagation, Microstructure, Tests, Aluminum containing alloys, Vanadium containing alloys, Molybdenum containing alloys, Fatigue(Materials), Aircraft, Spacecraft, Nuclear reactor materials, Mechanical properties.
Identifiers: NTISNTIS.

Research is cited on creep of titanium and its alloys with regard to composition, stress corrosion, fracture, microstructure and tests. Many reports deal with applications to aircraft, spacecraft, and nuclear reactors. (This updated bibliography contains 135 abstracts, 24 of which are new entries to the previous edition.)

N76-25374/9GA PC$4.00/MF$3.00
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
The Stress Corrosion Resistance and the Cryogenic Temperature Mechanical Behavior of 18-3 Mn (Nitronic 33) Stainless Steel Parent and Welded Material.
J. W. Montano. Jun 76, 29p NASA-TM-X-73309

Descriptors: *Corrosion resistance, *Cryogenics, Low temperature, Mechanical properties, *Stainless steels, *Welded structures, Elongation, Pitting, Room temperature, Salt spray tests.
Identifiers: Steel Nitronic 33.

For abstract, see STAR 1416

N76-25375/8GA PC$6.00/MF$3.00
Martin Marietta Corp., Orlando, Fla.
Hydrogen Embrittlement of Structural Alloys. A Technology Survey.
J. L. Carpenter, Jr., and W. F. Stuhrke. Jun 76, 133p NASA-CR-134962, OR-14178
Contract NAS3-19530

Descriptors: *Abstracts, *High strength alloys, *Hydrogen embrittlement, *Metals, Aircraft structures, Construction materials, Corrosion, Spacecraft structures, Stress corrosion cracking.
Identifiers: Bibliographies.

For abstract, see STAR 1416

PATENT-3 926 684 Not available NTIS
Department of the Navy Washington D C
High Critical Current Superconductors and Preparation Thereof.
Patent,
David G. Howe. Filed 25 Nov 74, patented 16 Dec 75, 5p AD-D002 642/7, PAT-APPL-527 000
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Superconductors, *Patents, Composite materials, Vanadium alloys, Gallium alloys, Niobium alloys, Tin alloys, Copper alloys, Silicon alloys, Fabrication, Intermetallic compounds, Silicides, Vanadium compounds, Eutectics.
Identifiers: *Metal matrix composites, Eutectic composites, PAT-CL-148-11.5.

It is an object of the invention to provide a method of manufacturing superconductors with near or actual two phase alloys with a critical temperature above 14.5K. This is achieved by composite superconductors made from vanadium-gallium (V-Ga) and copper-gallium (Cu-Ga) or niobium-tin (Nb-Sn) and copper-tin (Cu-Sn) or vanadium-silicon (V-Si) and copper-silicon (Cu-Si) with an increased amount of metal solute and made by a mechanical deformation process. This includes a homogenization anneal to improve the uniformity of dispersion in the alloy, several series of anneals during the reduction in cross sectional size of the composite thereby avoiding degradation of the composite by stresses and strains imparted during the mechanical reduction, and a solid state reaction between the two alloys to form the superconducting interfacial layer in a vacuum or in an inert atmosphere.

PATENT-3 958 983 Not available NTIS
Department of the Interior, Washington, D.C.
Decomposition of Chalcopyrite.
Patent,
Walter Lyman Staker. Filed 19 Jun 75, patented 25 May 76, 4p PB-255 370/9, PAT-APPL-588 647
Supersedes PB-245 367.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Copper ores, *Leaching, *Patents, Chalcopyrite, Transition metals, Chromium inorganic compounds, Titanium inorganic compounds, Vanadium inorganic compounds, Hydrochloric acid, Extractive metallurgy.
Identifiers: PAT-CL-75-101.

Chalcopyrite ore or concentrate is decomposed by reacting with an aqueous acid solution of a transition metal ion in a lower valence state. The metal is from the group consisting of chromium, vanadium and titanium.

PATENT-3 961 942 Not available NTIS
Department of the Interior, Washington, D.C.
Hydrometallurgical Process for Copper Recovery from Sulfide Ores.
Patent,
Philip R. Haskett, Carl H. Elges, III, Donald J. Bauer, and Roald E. Lindstrom. Filed 19 Mar 75, patented 8 Jun 76, 3p PB-255 377/4, PAT-APPL-559 942
Supersedes PB-244 193.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Hydrometallurgy, *Copper, *Patents, Extractive metallurgy, Leaching, Copper ores, Sulfide minerals, Potassium carbonates, Sodium hydroxide, Chalcopyrite, Oxidation.
Identifiers: PAT-CL-75-101.

The patent relates to the recovery of copper from sulfide ores achieved by placing the ore together with a caustic soda or potash solution in a pressure vessel. An oxidizing gas is then introduced into the vessel and the temperature and pressure of the system is adjusted as required. Copper ions are freed from the crystalline structure in the form of the complex anion, Cu(OH)4(2-). The copper may then be recovered by reduction or precipitation as cupric oxide.

PATENT-3 962 050 Not available NTIS
Department of the Interior, Washington, D.C.
Recovery of Zinc from Zinc Chloride by Fused Salt Electrolysis.
Patent,
Donald E. Shanks, and Frank P. Haver. Filed 21 May 75, patented 8 Jun 76, 3p PB-255 376/6, PAT-APPL-579 640
Supersedes PB-245 394.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Zinc, *Electrowinning, *Patents, Fused salts, Zinc chlorides, Lithium chloride, Potassium chloride, Electrolysis, Air pollution abatement.
Identifiers: PAT-CL-204-66.

Metallic zinc is recovered from zinc chloride by electrolysis of a molten bath mixture consisting essentially of zinc chloride and an electrolyte consisting of lithium chloride and potassium chloride. The electrolyte preferably consists of the LiCl-KCl eutectic mixture consisting of 59 mole percent LiCl and 41 mole percent KCl. The impurity specifications and pollution control regulations are met to a great extent by the electrolytic process.

PB-255 190/1GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Electron-Microscopical Studies of Passive Films on Stainless Steels.
Final rept.,
J. Yahalom, and L. K. Ives. 1976, 4p
Prepared in cooperation with Technion - Israel Inst. of Tech., Haifa. Dept. of Materials Engineering. Pub. in Proceedings USA-Japan Seminar on Passivity and its Breakdown on Iron and Iron Base Alloys, Honolulu, HI, March 10-12, 1975, p69-71 (National Association of Corrosion Engineers, Houston, TX, 1976).

Descriptors: *Stainless steels, *Iron alloys, *Chromium containing alloys, *Passivity, Electron microscopy, Films, X ray analysis, Electron diffraction, Corrosion prevention.
Identifiers: Steel 304, Steel 316, Transmission electron microscopy.

Transmission electron microscopy and diffraction were employed to study in situ films over corrosion pits in ferritic Fe-Cr alloys containing 5, 12 and 19 wt. % Cr and in commercial AISI 304 and 316 stainless steels. The composition of passive films extracted from the pits was obtained by energy dispersive x-ray emission analysis. In all cases an enhanced concentration of Cr was observed, though to a lesser extent in the Fe-5% Cr alloy. A substantial difference in the crystalline structure and morphology was found to exist among the various alloys. The differences in passivity exhibited by the alloys and the mechanism of breakdown are discussed in light of these findings.

PB-255 202/4GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Chemical Breakdown of Passivity.
Final rept.,
Jerome Kruger. 1976, 9p
Sponsored in part by Office of Naval Research, Arlington, Va. Pub. in Proceedings USA-Japan Seminar on Passivity and its Breakdown on Iron and Iron Base Alloys, Honolulu, HI, March 10-12, 1975, p91-98 (National Association of Corrosion Engineers, Houston, TX, 1976).

Descriptors: *Passivity, *Corrosion, *Iron alloys, Mathematical models, Chemical composition, Corrosion environments, Reaction kinetics, Chlorides, Ions, Radioactive materials, Ion mobility, Adsorption, Mechanical properties.

A review is given of the various theoretical models for the chemical breakdown of passivity. The models discussed are adsorbed in displacement, ion migration, or penetration and chemico-mechanical breakdown. The models are then related to data in the literature on breakdown initiation kinetics, critical potentials for breakdown, and alloy composition and structural and environmental factors. Based on the above examination a number of critical questions are posed that must be answered in order to understand chemical breakdown of the passive film.

PB-255 203/2GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Ellipsometric Spectroscopic Study of Breakdown of Fe-Cr and Fe-Cr-Mo Alloys.
Final rept.,
C. L. McBee, and J. Kruger. 1976, 3p
Pub. in Proceedings USA-Japan Seminar on Passivity and its Breakdown on Iron and Iron Base Alloys, Honolulu, HI, March 10-12, 1975, p131-132 (National Association of Corrosion Engineers, Houston, TX, 1976).

Descriptors: *Iron alloys, *Corrosion, *Chlorides, Chromium containing alloys, Molybdenum containing alloys, Polarimetry, Spectroscopy, Passivity.

Ellipsometric spectroscopy was recently applied to the study of the breakdown of passivity on pure iron single crystal surfaces. These studies first obtained a measurement of the ellipsometric parameters, delta and psi, as a function of wavelength for a passivated surface held at a potential in a buffered borate solution. Chloride ions were then added, and it was noted for most wavelengths that no changes were found during the induction period prior to breakdown. However, at a few wavelengths, delta and psi did vary with chloride additions. Using these changes and current measurements, it was possible to study events leading to the breakdown of Fe. The work described here extends the technique employed in previous studies to Fe-Cr-Mo alloys.

PB-255 323/8GA PC$4.00/MF$3.00
Federal Highway Administration, Washington, D.C. Structures and Applied Mechanics Div.
Mechanical and Chemical Properties of Selected Steels Used in Bridge Structures.
Final rept.,
Karl H. Frank. Nov 74, 45p FHWA/RD-75-79

Descriptors: *Structural steels, *Bridges(Structures), Mechanical properties, Chemical properties, Impact tests, Tensile properties, Wrought iron.
Identifiers: Steel A36, Steel A441, Steel A514.

The mechanical and chemical properties of a variety of bridge steels were examined. Emphasis was placed on the Charpy impact behavior of the materials. The materials tested included wrought iron, ASTM A36, ASTM A441, and ASTM A514 steels. The material came from actual bridges and from laboratory fatigue specimens. All the steels tested with the exception of one wrought iron met the chemistry and tensile requirements of the applicable specification. No degradation in tensile properties was detected due to service which the steels were subjected to. The Charpy impact test results revealed considerable differences between materials with similar tensile behavior. No correlation was found between the date of manufacture, chemistry, method of deoxidation, elongation or reduction in area with the measured Charpy behavior.

PB-255 350/1GA PC$4.00/MF$3.00
Bureau of Mines, Albany, Oreg. Albany Metallurgy Research Center.
Smelting of Arseniferous Copper Concentrate in an Electric-Arc Furnace.
Rept. of investigations, 1976,
D. L. Paulson, W. Anable, W. L. Hunter, and R. S. McClain. Jun 76, 36p BuMines-RI-8144
Prepared in cooperation with American Smelting and Refining Co., Tacoma, Wash.

Descriptors: *Copper ores, *Smelting, *Electric arc furnaces, *Air pollution abatement, Reverberatory furnaces, Slags, Gas analysis, Flue gases, Arsenic, Sulfur dioxide, Process charting, Byproducts, Chemical analysis, Lead, Zinc, Antimony, Extractive metallurgy, Feasibility, Flue dust.

The Bureau of Mines and ASARCO Inc. entered a cooperative agreement to determine the feasibility of producing copper matte in an electric furnace from blends of copper concentrate similar to those currently smelted in a gas-fired reverberatory system at ASARCO's, Inc. installation in Tacoma, Washington. A 800 kva electric-arc furnace was used to determine the distribution of constituents when arseniferous concentrates are being smelted in an electric-arc furnace. Test results from smelting 40 tons of materials indicated that electric smelting is more like a conventional gas-fired system than originally expected. Although gas composition over the molten bath is considerably different in an electric furnace, the secondary constituents such as arsenic, lead, zinc, and antimony behaved the same as in a reverberatory furnace. The results established that an electric furnace would be compatible with sulfur and particulate recovery facilities that are being used.

PB-255 399/8GA PC$3.50/MF$3.00
Bureau of Mines, Reno, Nev. Reno Metallurgy Research Center.
Extraction and Recovery of Molybdenum and Rhenium from Molybdenite Concentrates by Electrooxidation: Process Demonstration.
Rept. of investigations,
B. J. Scheiner, R. E. Lindstrom, and D. L. Pool. Jun 76, 18p BuMines-RI-8145

Descriptors: *Molybdenum, *Rhenium, *Electrometallurgy, *Oxidation, Molybdenite, Copper ores, Porphyry, Brines, Sodium chloride, Separation, Solvent extraction, Activated carbon, Sulfur dioxide, Process charting, Extractive metallurgy, Electric power consumption.

The Federal Bureau of Mines has successfully demonstrated an electrooxidation-solvent extraction-carbon adsorption process for recovering molybdenum and rhenium from off-grade concentrates. The flow sequence consists of dissolution of metal values by electrooxidation, liquid-solid separation by thickening, acidification and chlorate ion removal by sulfur dioxide treatment, solvent extraction to concentrate the molybdenum and rhenium, separation of molybdenum and rhenium by carbon adsorption, and metal recovery by crystallization. Molybdenum and rhenium were recovered as ammonium paramolybdate and ammonium perrhenate. Electrolysis of brine-concentrate pulps to generate a hypochlorite oxidizing agent in situ resulted in the dissolution of 98.9 and 99.1 pct of the molybdenum and rhenium, respectively, at an energy consumption of 13.7 kwhr/lb of molybdenum extracted.

PB-255 441/8GA PC$3.50/MF$3.00
Bureau of Mines, Albany, Oreg. Albany Metallurgy Research Center.
Steel from Urban Waste.
Rept. of investigations,
Willard L. Hunter. Jun 76, 20p* BuMines-RI-8147, AMRC-1624

Descriptors: *Steel making, *Solid waste disposal, *Metal scrap, *Materials recovery, Iron, Refuse disposal, Reinforcing steels, Electric arc furnaces, Containers, Cans, Metal working, Incinerators, Residues, Industrial wastes.
Identifiers: *Metal recycling, Secondary materials industry.

This report describes a series of steel heats made in a one-ton arc furnace from ferrous urban waste and urban waste blended with heavy-melting scrap. The tests were conducted to determine if ferrous urban waste could be melted to produce steel having commercially acceptable properties. The steel products were cast into nominal 50-pound and 750-pound ingots. The 50-pound ingots were evaluated by National Steel's research laboratory at Weirton, West Virginia and by the College Park Metallurgy Research Center at College Park, Maryland. Selected 750-pound ingots from eight heats were rolled by a local steel bar mill to No. 5 reinforcing bar. The tests provided quantitative information on the effect of bulk density, tramp metal content, and oxide content of ferrous urban waste on the melting characteristics of these materials.

PB-255 546/4GA PC$3.50/MF$3.00
Bureau of Mines, Twin Cities, Minn. Twin Cities Metallurgy Research Center.
Roasting Nonmagnetic Taconites in a Fluid Bed Using Low-Rank Fuels as Reductants.
Rept. of investigations,

J. E. Pahlman, P. L. Ruzzi, and R. B. Schluter.
Jun 76, 20p BuMines-RI-8149

Descriptors: *Iron ores, *Taconite, *Roasting, *Fluidized bed processing, Magnetic fields, Subbituminous coal, Lignite, Reduction(Chemistry), Combustion, Extractive metallurgy, Heat recovery.
Identifiers: Waste heat utilization.

The Bureau of Mines has performed research on a fluid-bed magnetic roasting process for nonmagnetic taconites which uses low-rank coals and lignites as reductants and fuels. Roasting tests on a Michigan nonmagnetic taconite were conducted at temperatures in the range 600 to 725 C with lignite or subbituminous coal as reductants. Partial combustion of the reductant reduced the amount of heat externally applied to the reactor to maintain the desired reactor temperature. Cleaned, dried reactor top gases were recycled to recover a portion of the reducing potential in these gases without adversely affecting concentrate grade and iron recovery. Highest iron recoveries for magnetic concentrates were obtained at a roast temperature of 650 C with lignite and at a roast temperature of 725 C in the case of subbituminous coal roasting. Magnetic concentrates were obtained which were comparable to commercial concentrates.

PB-255 552/2GA PC$4.00/MF$3.00
Bureau of Mines, Albany, Oreg. Albany Metallurgy Research Center.
Production of Blister Copper by Electric Furnace Smelting of Dead-Burned Copper Sulfide Concentrates.
Rept. of investigations,
D. L. Paulson, R. B. Worthington, and W. L. Hunter. Jun 76, 34p BuMines-RI-8131

Descriptors: *Copper ores, *Smelting, *Electric arc furnaces, *Blister copper, *Air pollution abatement, Reduction(Chemistry), Sulfur dioxide, Extractive metallurgy, Chalcopyrite, Pilot plants, Slags, Electric power consumption.

The Bureau of Mines is investigating methods for extracting copper from sulfide ores under conditions that provide for control of gaseous and solid emissions. Under this program, a new electrothermic reduction process was developed to produce blister copper after collecting essentially all of the sulfur by a single-unit operation. The process feasibility was indicated by a laboratory-scale investigation that demonstrated chalcopyrite concentrate can be roasted to less than 1 percent sulfur and that the resulting calcine can be reduced with carbon to blister copper by a cyclic process in a single arc-smelting furnace. Pilot-scale tests in an 800-kV-A electric-arc furnace demonstrated that 98.4 pct of the contained copper can be continuously recovered as metal by operating at bath temperatures between 1,350 and 1,375 C. Smelting rates of approximately 225 lb of blend sq ft of bath surface/hr resulted in power consumptions of approximately 520 kW-hr/ton of blend.

PB-255 663/3GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Comparison of Matrix Inversion, Monte Carlo, and Diffusion of Probability Techniques for Calculation of Diffusion Correlation Factors.
Final rept.,
J. R. Manning. Apr 76, 13p
Pub. in Proceedings of Symposium on Computer Simulation for Materials Applications, Gaithersburg, MD, April 19-21, 1976. Nucl. Metall. 20, Pt.1, p109-120 Apr 76.

Descriptors: *Diffusion, *Metals, Computerized simulation, Monte Carlo method, Alloys, Defects, Correlation.
Identifiers: Matrix inversion.

The diffusion correlation factor can be determined by calculating the mean square atom displacement resulting from a long series of atom jumps. Monte Carlo computer simulation techniques are coming more-and-more to be applied to this problem. Possible problems encountered in applying the common matrix inversion technique to correlation factor calculations are discussed, and the relative advantage and disadvantages of matrix inversion and Monte Carlo techniques are examined. In some cases, a diffusion of probability technique that involves only one matrix inversion is found to provide more nearly accurate results than do either the usual matrix inversion or Monte Carlo techniques. As examples, correlation approximations for diffusion in random binary alloys and for diffusion via divacancies are discussed.

11H. Oils, Lubricants, and Hydraulic Fluids

AD-A027 397/9GA PC$4.00/MF$3.00
Southwest Research Inst San Antonio Tex Army Fuels and Lubricants Research Lab
Analytical Approach to the Characterization of Military Lubricants.
Interim rept.,
L. L. Stavinoha, G. E. Fodor, F. M. Newman, and S. J. Lestz. Mar 76, 43p Rept no. AFLRL-77
Contract DAAG53-76-C-0003

Descriptors: *Chemical analysis, *Lubricants, Esters, Spectrophotometry, Synthetic materials, Gas chromatography, Liquid chromatography, Chemical composition, Laboratory equipment, Infrared spectroscopy, Distillation, Separation, Alcohols, Lubricating oils, Hydrolysis, Boiling point, Crude oil, Hydraulic fluids.
Identifiers: Acidity.

As an integral part of the Army's overall power train lubrication research effort, analytical/instrumental methods continue to be developed for use in determining compositional characteristics of new lubricants and to detect unusual contaminants in new and used lubricants. Included among the various types of instruments being used in this work to characterize lubricants are: gas chromatography (GC), high performance liquid chromatography (reversed-phase, adsorption, gel-permeation), and spectrophotometry (IR, UV, AA, XRF). Methods to separate lubricants into component parts according to chemical types in order to simplify the subsequent analysis and identification of the component parts have been applied with favorable results. Characterization of lubricants to include additives is not yet complete. Ultimate refinements of this approach will provide the detailed compositional information needed to define base stock characterization, develop correlation of lubricant component to equipment performance, and identify sources of new, used, synthetic and re-refined lubricants, power train and hydraulic fluids.

11I. Plastics

AD-A027 447/2GA PC$4.00/MF$3.00
Stanford Research Inst Menlo Park Calif
Photooxidation and Accelerated Testing of Polypropylene.
Final rept. 1 Jul 73-18 Jun 76,
Frank R. Mayo, Harold Richardson, and Theodore Mill. Jul 76, 48p ARO-11337.1-C
Contract DAHC04-73-C-0035

Descriptors: *Polypropylene, *Environmental tests, *Weathering, Photochemical reactions, Accelerated testing, Degradation, Oxidation, Tensile properties, Fractionation, Mechanical properties, Films, Free radicals, Stresses.

The ultimate objective of the research described here was to devise an accelerated test to predict the useful lives of stabilized polypropylene (PP) resins exposed to sun and weather. The point of departure was a study of radical-initiated oxidations of polyolefins in the dark at 20 C to 55 C; 90% of the oxygen consumed was accounted for and a simple mechanism was consistent with the products. (Author)

NTIS/PS-76/0586/8GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Heat Resistant Plastics. Part 1. Nitrogen Containing Polymers (A Bibliography with Abstracts).
Rept. for 1964-Aug 76,
Edward J. Lehmann. Aug 76, 229p*
Supersedes NTIS/PS-75/560.

Descriptors: *Bibliographies, *Heat resistant plastics, *Polyamide resins, *Polyimide resins, Polymerization, Synthesis(Chemistry), Nitrogen heterocyclic compounds, Elastomers, Benzimidazoles, Thermal stability, Decomposition reactions, Polymeric films, Mechanical properties, Abstracts.
Identifiers: Ladder polymers, *Polyquinoxalines, Polybenzoxazoles, *Polybenzimidazoles, Nomex polymers, BBB polymers, BBL polymers, NTISNTIS.

The synthesis, applications, testing, decomposition, and properties of heat resistant nitrogen containing polymers are covered in the bibliography. The major polymers discussed are polyquinoxalines and polybenzimidazoles. (This updated bibliography contains 224 abstracts, 53 of which are new entries to the previous edition.)

NTIS/PS-76/0587/6GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Heat Resistant Plastics. Part 2. Silicone, Carborane, Halocarbon, and Other Polymers (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
Edward J. Lehmann, and Diane M. Cavagnaro. Aug 76, 201p*
Supersedes NTIS/PS-75/561.

Descriptors: *Bibliographies, *Heat resistant plastics, *Halocarbon resins, *Silicone resins, Polycyclic compounds, Polymerization, Thermal stability, Mechanical properties, Synthesis(Chemistry), Elastomers, Decomposition reactions, Carboranes, Phenolic resins, Halohydrocarbons, Fluorohydrocarbons, Abstracts.
Identifiers: *Polycarboranes, Dexsil polymers, *Polyferrocines, Ladder polymers, *Fluorinated polymers, NTISNTIS.

Research on heat resistant plastics and elastomers, excluding nitrogen containing polymers, are presented in the bibliography. The synthesis, chemical properties, physical and mechanical properties, applications, and fabrication of such polymers are covered. The major resins studied include polysilicones, polycarboranes, phosphorus containing polymers, and halocarbon polymers. (This updated bibliography contains 196 abstracts, 27 of which are new entries to the previous edition.)

NTIS/PS-76/0628/8GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Polycarbonates (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
Kirk G. Werner, and Diane M. Cavagnaro. Aug 76, 169p*
Supersedes NTIS/PS-75/569.

Descriptors: *Bibliographies, *Polycarbonate resins, Synthesis(Chemistry), Physical properties, Chemical properties, Manufacturing, Thermal stability, Mechanical properties, Utilization, Fabrication, Combustion.

The bibliography presents selected annotated references on synthesis, properties, and uses of polycarbonate resins. The physical, mechanical, and chemical behavior of polycarbonates are covered, as well as processing and manufacturing techniques. (This updated bibliography contains 184 abstracts, 24 of which are new entries to the previous edition.)

11J. Rubbers

AD-A027 555/2GA PC$4.00/MF$3.00
Harry Diamond Labs Adelphi Md
Alcohol-Sensitive Epoxy Formulations for Temporary or Repairable Embedment.
Technical rept.,
Sheng Yen Lee, and Keith C. Bruce. Jun 76, 26p
Rept no. HDL-TR-1757

Descriptors: *Embedding substances, *Potting compounds, *Epoxy resins, *Repair, Alcohols, *Organic solvents, Formulations, Sensitivity, Fillers, Pyrrolidines, Encapsulation.

Repairable embedding epoxy formulations have been developed that are alcohol sensitive and hence can be readily removed with an alcohol without damage to the embedded components. The alcohol sensitivity is greatly enhanced with poly(N-vinyl-2-pyrrolidone) as filler. Some basic thermal, electrical, and mechanical properties of the cured epoxies were found to be satisfactory. Being inherently more hydrophilic than the regular epoxy, the materials are not intended for the continuous use in an environment of high humidity. For occasional exposures, a low filler level or an application of a protective thin coating of a regular epoxy is advisable. (Author)

11K. Solvents, Cleaners, and Abrasives

PAT-APPL-679-310/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Fiber Optics Grinding and Polishing Disc.
Patent Application,
Adolph Lee Lewis. Filed 22 Apr 76, 12p AD-D002 610/4
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Fiber optics, *Grinding wheels, Fiber optics transmission lines, Cables, Polishing, Epoxy resins.
Identifiers: *Patent applications, PAT-CL-51-261.

The patent application describes a fiber optics grinding and polishing disc comprising a circular planar base member having a plurality of discrete concentric sections of material bonded thereto. A central circular section is surrounded by additional contiguous concentric annular sections, each such section consisting of a mixture of epoxy and particle abrading or polishing material bonded to the circular planar base member to form a composite structure of substantially uniform thickness. Each of the sections provides a different degree of abrading or polishing capability.

PB-255 701/5GA PC$5.50/MF$3.00
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC Advertising Substantiation Program - Dishwashers and Dishwashing Detergents. Documentation of Economics Laboratory, Inc.
4 Sep 75, 108p FTC-752-3164-EL

Descriptors: *Publicity, *Manufacturers, *Detergents, Cleaning, Dishwashers, Effectiveness, Formulations.
Identifiers: *Truth in advertising, Economics Laboratory Incorporated, Electrasol dishwashing detergent.

Documentation is submitted in support of various claims concerning Electrasol Dishwashing Detergent's ability to remove cooked-on food from pots or pans in automatic dishwashers and its performance in different brands of dishwashers. Portions of this document are not fully legible.

PB-255 702/3GA PC$6.00/MF$3.00
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC Advertising Substantiation Program. Dishwashers and Dishwashing Detergents. Documentation of Whirlpool Corporation.
22 Aug 75, 131p FTC-752-3164-WP

Descriptors: *Publicity, *Manufacturers, *Detergents, Cleaning, Effectiveness, Formulations, Dishwashers.
Identifiers: *Truth in advertising, Whirlpool Corporation, Whirlpool dishwasher with a super scour cycle.

Documentation is submitted in support of various claims concerning the ability of the Whirlpool dishwasher with a Super Scour cycle to remove cooked-on food from any pot or pan washed in it without any prior scrubbing, scraping or rinsing of the pot or pan. Portions of this document are not fully legible.

PB-255 707/2GA PC$21.25/MF$3.00
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC Advertising Substantiation Program: Dishwashers and Dishwashing Detergents. Documentation of Hobart Corporation.
8 Oct 75, 817p FTC-752-3164-HC

Descriptors: *Publicity, *Manufacturers, *Detergents, Cleaning, Effectiveness, Dishwashers.
Identifiers: *Truth in advertising, Hobart Corporation, KitchenAid dishwashers.

Documentation is submitted in support of various claims concerning the KitchenAid dishwasher; that it is able to remove cooked-on food from any pot or pan washed in it without any prior scrubbing, scraping or rinsing of the pot or pan; that in a nationwide survey, more independent dishwasher repairmen said the KitchenAid dishwasher performs better, needs less service, lasts longer and is more reliable; and that in the same survey, more independent dishwasher repairmen named KitchenAid as the brand of dishwasher they would buy for their own homes. Portions of this document are not fully legible.

11L. Wood and Paper Products

PB-255 305/5GA PC$3.50/MF$3.00
Virginia Polytechnic Inst. and State Univ., Blacksburg. Pallet and Container Research Center.
Stiffness and Flexural Strength of Hardwood Pallets Manufactured by the R. and L. Corporation,
E. George Stern. Apr 76, 25p

Descriptors: *Pallets, *Wood products, *Flexural strength, Stiffness tests, Deflection, Loads(Forces), Moisture content, Lumber.
Identifiers: Hardwoods.

Six different pallets were tested for their static stiffness and flexural strength. They were reversible or non-reversible, double-face, flush or wing-type, stringer or block-type, oak or mixed-hardwood pallets. They ranged in size from 37 in. by 35 in. to 60 in. by 60 in. The deflections of the pallet sides, the pallet ends, and the pallet center were recorded at 200-lb. load increments up to the ultimate test loads ranging from 4,200 lb. to 12,800 lb.

PB-255 306/3GA PC$3.50/MF$3.00
Virginia Polytechnic Inst. and State Univ., Blacksburg. Pallet and Container Research Center.
Performance of Pallet Nails and Staples in 22 Southern Hardwoods,
E. George Stern. Jun 76, 21p

Descriptors: *Wood products, *Pallets, *Nails(Fasteners), *Staples, Performance evaluation, Tests, Tables(Data).
Identifiers: Hardwoods.

The effectiveness of pointless, helically threaded, hardened-steel, 3 by 0.120-inch, pallet nails with umbrella heads and 2 1/2-inch, 15-gauge, 7/16-inch crown, plastic-coated, pallet staples in 22 hardwoods grown on southern pine sites was determined on the basis of tests on 522 joints. Specific average performance values were derived from the test data for the tested joints made of, and representative for, these 22 hardwood species.

PB-255 307/1GA PC$3.50/MF$3.00
Virginia Polytechnic Inst. and State Univ., Blacksburg. Pallet and Container Research Center.
Timber Harvesting for the Pallet and Container Industries,
W. B. Stuart, and T. A. Walbridge, Jr. May 76, 13p Bull-144

Descriptors: *Wood products, *Harvesting, *Pallets, *Containers, Structural timber, Manufacturing, Wood wastes, Recovery.

This report is the first one within this bulletin series to provide novel ideas in timber harvesting, primary manufacturing, and residue recovery of considerable potential to the pallet and container industries.

PB-255 308/9GA PC$3.50/MF$3.00
Virginia Polytechnic Inst. and State Univ., Blacksburg. Pallet and Container Research Center.
Comparative Performance of Southern Pine Pallets, Part II,
Walter B. Wallin, and E. George Stern. Mar 76, 21p Bull-142
See also Part 1, PB-251 667.

Descriptors: *Pallets, *Pine wood, *Performance tests, Economic analysis, Cost engineering, Loads(Forces), Safety engineering, Mathematical analysis, Comparison.

Based on a sample of 60 southern pine pallets purchased, produced, and used commercially in a severe handling environment for a total of 16 one-way trips, it was found that the pallets performed as predicted. The expected economic life is 60 one-way uses on the average, ranging from 16 uses to 180 uses. The expected cost per use is $0.18 on the average, ranging from $1.07 to $0.06. The safe loads obtained from laboratory test results were 38 percent higher than predicted for the pallets used in drive-in racks bearing along the outside stringers, and 1.6 percent higher than predicted for pallets used in racks bearing on the ends of the pallet with the stringers stressed as beams.

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-A027 186/9GA PC$4.00/MF$3.00
New York Univ N Y Courant Inst of Mathematical Sciences
A Generalization of Resolution,
Malcolm C. Harrison, and Norman Rubin. Mar 76, 32p
Contract N00014-75-C-0571

Descriptors: Theorems, Hypotheses, *Programming languages, *Linguistics, High level languages, Factor analysis, Graphics.
Identifiers: Resolution principle, Unification procedures, Axioms, Inference, Paramodulation.

This paper defines a generalization of the resolution principle for theorem-proving, which permits a hierarchical organization within the theorem-prover. The generalization corresponds to an extension of the usual unification procedures. A graph-theoretic categorization of sets of clauses with input or unit refutations is given, and completeness theorems are proved in this category. In the case of sets of clauses which include the equality predicate, the generalization gives a new technique for treating equality, for which a completeness theorem is proved. An implementation of these ideas gives results which suggest that this is a more efficient method for treating equality than previously proposed schemes. (Author)

AD-A027 246/8GA PC$5.00/MF$3.00
Naval Postgraduate School Monterey Calif
Reduced Order Approximations to Higher Order Linear Systems.
Master's thesis,
Jerry Dennis Thompson. Jun 76, 79p

Descriptors: *Approximation(Mathematics), *Linear systems, *Mathematical programming, Computer programs, Mathematical models, Graphics, Display systems, Tables(Data), Error analysis, Numerical analysis.
Identifiers: Routh approximation method, Dominant pole method.

Low order models are derived by a computer program technique which utilizes the Routh Approximation Method of analysis. Comparisons are made between this method and that of the Dominant Pole Method and the Iterative Optimization Method of analysis. Low order models are developed from higher-order linear systems and compared to that system in response to input excitations consisting of a Step and a Ramp. Graphical displays and numerical tables provide a basis for error analysis and comparisons between the approximation techniques. (Author)

AD-A027 277/3GA PC$5.00/MF$3.00
Illinois Univ At Urbana-Champaign Coordinated Science Lab
On Optimal Control Problems with State-Variable Inequality Constraints.
Technical rept.,
Albert Lewis Hendricks. May 76, 98p Rept nos. R-727, UILU-ENG-76-2215
Contract DAAB07-72-C-0259, Grant AF-AFOSR-2570-73

Descriptors: *Control theory, Differential equations, Inequalities, Optimization, Boundary value problems, Theses.
Identifiers: Time invariant systems, Multipoint boundary value problems.

The topic for this thesis is the state-variable inequality constrainted optimal control problem. The problem is formulated as a standard optimal control problem with one additional constraint of the form $S(x(t)) < or = 0$. This constraint is assumed to be of p-th order where p is an integer and $p > or = 1$. In particular, the p-th time derivative of the constraint is the first to contain the control variable explicity.

AD-A027 292/2GA PC$4.50/MF$3.00
Naval Postgraduate School Monterey Calif
Theory and Testing of Uniform Random Number Generators.
Master's thesis,
Gerard Paul Learmonth. Jun 76, 60p

Descriptors: *Random number generators, Digital systems, *Sequences(Mathematics), Algorithms, Statistical tests, Digital computers, Shift registers, Algebra, Groups(Mathematics).
Identifiers: Lattice tests, Spectral test, Linear congreuential sequences, Finite field arithmetic, Theses.

Two structural tests for random number generators of the Lehmer congruential type are discussed. They are known now to be essentially equivalent but are formulated incorrectly and the computational algorithms to implement the tests are unnecessarily complicated. New algorithms for these tests will be sketched. (Author)

AD-A027 312/8GA PC$3.50/MF$3.00
Stanford Univ Calif Dept of Electrical Engineering
Square-Root Algorithms for Least-Squares Estimation,
Martin Morf, and Thomas Kailath. 12 Aug 74, 13p AFOSR-TR-76-0616
Contracts F44620-74-C-0068, N00014-67-A-0112-0044
Availability: Pub. in IEEE Transactions on Automatic Control, vAC-20 n4 p487-497 Aug 75.

Descriptors: *Algorithms, *Least squares method, Linear systems, Recursive functions, Computations, Equations, Control theory, Reprints.

Several new algorithms and more generally a new approach to recursive estimation algorithms for linear dynamical systems are presented. Earlier results in this area have been obtained by several others, especially Potter, Golub, Dyer and McReynolds, Kaminski, Schmidt, Bryson, and Bierman on what are known as square-root algorithms. The results described are more comprehensive. They show how constancy of parameters can be exploited to reduce the number of computations and to obtain new forms of the Chandrasekhar-type equations for computing the filter gain. The approach is essentially based on certain simple geometric interpretations of the overall estimation problem. One goal is to attract attention to non-Riccatibased studies of estimation problems.

AD-A027 314/4GA PC$3.50/MF$3.00
Michigan Univ Ann Arbor Dept of Mathematics
Anticritical Graphs,
Frank Herary, and Carsten Thomassen. 22 May 74, 9p AFOSR-TR-76-0626
Grant AF-AFOSR-2502-73
Availability: Pub. in Math. Proc. Camb. Phil. Soc., v79 n2 p11-18 1976.

Descriptors: *Graphs, Numbers, Critical path methods, Colors, Reprints.
Identifiers: *Anticritical graphs, Chromatic number, *Graph theory.

The term critical graph has been used most frequently to mean a graph such that the removal of any line decreases the chromatic number. Anticritical graphs are investigated here with respect to the following: chromatic number, line-chromatic number, point-connectivity, line-connectivity, point-independence no., line-independence no., diameter, radius, and cyclability number.

AD-A027 321/9GA PC$3.50/MF$3.00
Princeton Univ N J Dept of Electrical Engineering
Two Necessary Conditions on the Representation of Bivariate Distribution by Polynomials,
Shu-Gwei Tyan, Haluk Derin, and John B. Thomas. Aug 74, 8p ARO-7624.56-EL
Contract DAHC04-69-C-0012, Grant NSF-GK-24187
Availability: Pub. in the Annals of Statistics, v4 n1 p216-222 1976.

Descriptors: *Random variables, Polynomials, Bivariate density functions, Hilbert space, Reprints.

Let X and Y be two unbounded random variables. Then two necessary conditions are proved concerning the structure of the bivariate distribution function of X and Y when it is expanded in the orthonormal polynomials of its marginal distributions. The first condition concerns the shrinking of the polynomial representation into a diagonal form, and the second is a generalization of the Sarmanov-Bratoeva theorem. (Author)

AD-A027 322/7GA PC$3.50/MF$3.00
California Univ Santa Barbara Inst for Algebra and Combinatorics
Subpermanents of Doubly Stochastic Matrices,
Henryk Minc. 4 Oct 74, 5p AFOSR-TR-76-0684
Grant AF-AFOSR-2164-72
Availability: Pub. in Linear and Multilinear Algebra, v3 p91-94 1975.

Descriptors: *Stochastic processes, *Matrices(Mathematics), Linear algebra, Reprints.
Identifiers: Double stochastic matrices, Subpermanents.

It is shown that if all subpermanents of order k of an n x n doubly stochastic matrix are equal for some $k < or = n-2$, then all of the matrix must be equal to 1/n.

AD-A027 323/5GA PC$3.50/MF$3.00
California Univ Santa Barbara Inst for Algebra and Combinatorics
Bilinear Functionals on the Grassmannian Manifold,
Marvin Marcus, and Herbert Robinson. 20 Jan 74, 12p AFOSR-TR-76-0682
Grant AF-AFOSR-2164-72
Availability: Pub. in Linear and Multilinear Algebra, v3 p215-225 1975.

Descriptors: *Linear algebra, Functional analysis, Eigenvectors, Vector spaces, Set theory, Matrices(Mathematics), Reprints.
Identifiers: *Bilinear functionals, *Grassmannian manifold.

No abstract available.

AD-A027 324/3GA PC$3.50/MF$3.00
California Univ Santa Barbara Inst for Algebra and Combinatorics
Congruence Maps and Derivations,
Marvin Marcus, and M. Shafqat Ali. 23 Jul 75, 21p AFOSR-TR-76-0683
Grant AF-AFOSR-2164-72
Availability: Pub. in Linear and Multilinear Algebra, v3 p115-133 1975.

Descriptors: *Linear algebra, Matrices(Mathematics), *Mapping(Transformations), Conformal mapping, Eigenvectors, Derivatives(Mathematics), Reprints.

No abstract available.

AD-A027 326/9GA PC$3.50/MF$3.00
Florida State Univ Tallahassee Dept of Statistics
A Class of Generalized Bayes Minimax Estimators of a Multiple Regression Coefficient Vector,
Pi-Erh Lin, and Erwin P. Bodo. 1975, 10p
Contract N00014-67-A-0235-0006, Grant PHS-GM-913
Availability: Pub. in British Jnl. of Mathematical and Statistical Psychology, v28 p157-166 1975.

Descriptors: *Regression analysis, Bayes theorem, Vector analysis, Statistical samples, Random variables, Multivariate analysis, Covariance, Minimax technique, Reprints.
Identifiers: Bayesian estimation.

Consider a multiple regression problem in which the dependent and (three or more) independent variables have a joint normal distribution with unknown mean vector and unknown covariance matrix. Relative to a loss function depending on the statistical design at hand, a family of minimax estimators is obtained for the regression coefficient vector. It is shown that the maximum-likelihood estimator is dominated by the minimax estimators and hence inadmissible. A class of generalized Bayes estimators is obtained which may be expressed in terms of incomplete beta functions. With very mild conditions, the Bayes estimators are shown to be minimax.

AD-A027 332/8GA PC$3.50/MF$3.00
Oregon State Univ Corvallis School of Oceanography
Rotary Cross-Bispectra and Energy Transfer Functions between Non-Gaussian Vector Processes. I. Development and Example,
Neng-Chun Yao, Steve Neshyba, and Henry Crew. 25 Mar 74, 11p Rept no. Ref-75-13
Contract N00014-67-A-0369-0007, Grant NSF-GA-23015
Availability: Pub. in Jnl. of Physical Oceanography, v5 n1 p164-172 Jan 75.

Descriptors: *Transfer functions, *Oceanographic data, *Wind, Energy transfer, Spectrum analysis, Quadratic equations, Linear systems, Interactions, Reprints.
Identifiers: Random vector processes, Complex sets.

Bispectrum and cross-bispectrum analyses of the rotary components of stationary random vector processes are more easily interpreted than similar analyses of their scalar components, and have the advantage that the bispectral estimates are invariant to coordinate rotation. Application to some wind-ocean current data shows these to be non-Gaussian and subject to significant nonlinear coupling over a wide range of interacting triplets of rotary components. A set of complex-valued energy transfer functions are developed by which the magnitudes of the linear and quadratic interactions may be compared. (Author)

AD-A027 335/9GA PC$3.50/MF$3.00
Florida State Univ Tallahassee Dept of Statistics
A General Poisson Approximation Theorem,
R. J. Serfling. 29 Jul 74, 6p
Contract N00014-67-A-0235-0006
Supersedes Rept. no. FSU-Statistics-M301, TR-86-ONR, AD-787 555.
Availability: Pub. in The Annals of Probability, v3 n4 p726-731 1975.

Descriptors: *Approximation(Mathematics), Markov processes, Probability, Reprints.

A sum of nonnegative integer-valued random variables may be treated as a Poisson variable if the summands have sufficiently high probabilities of taking 0 value and sufficiently weak mutual dependence. This paper presents simple exact upper bounds for the error of such an approximation. An application is made to obtain a new extension for dependent events of the divergent part of the Borel-Cantelli lemma. The bounds are illustrated for the case of Markov-dependent Bernoulli trials. The method of the paper is to reduce the general problem to the special case of independent 0-1 summands and then make use of known bounds for this special case. (Author)

AD-A027 341/7GA PC$4.00/MF$3.00
Maryland Univ College Park
Unsolved Problems in the Asymptotic Estimation of Special Functions,
F. W. J. Olver. 1975, 46p ARO-11374.2-M
Grants DA-ARO-D-31-124-73-G204, NSF-GP-32841
Availability: Pub. in Theory and Application of Special Functions, p99-142 1975.

Descriptors: *Special functions(Mathematical), Asymptotic series, Linear differential equations, Approximation(Mathematics), Variables, Reprints.

The first part of this paper surveys the tools of asymptotic analysis that are presently available and those that are needed for the next stages of development of the asymptotic theory of special functions. Methods are grouped according to the number of free variables to which they achieve a uniform reduction. Topics include the approximation of functions defined parametrically by a definite intergral or infinite sum and approximate solutions of linear ordinary differential equations. The second part of the paper discusses the more importatnt special functions in increasing order of the total number of variables and parameters involved. Almost all asymptotic problems concerning special functions of one variable have been solved. For functions of two variables the problems are solved, or can be solved by use of existing asymptotic tools. It is in the case of functions depending on three variables (including parameters) that the most significant work can be expected in the immediate future. (Author)

AD-A027 395/3GA PC$3.50/MF$3.00
Case Western Reserve Univ Cleveland Ohio Dept of Mathematics and Statistics
A Stochastic Newton-Raphson Method.
Technical rept.,
Dan Anbar. 1 Jul 76, 18p Rept no. TR-24
Contract N00014-75-C-0529

Descriptors: *Stochastic processes, *Approximation, Least squares method, Theorems.
Identifiers: *Newton-Raphson method.

A stochastic approximation procedure of the Robbins-Monro type is considered. The original idea behind the Newton-Raphson method is used as follows. Given n approximations X(1),...,X(n) with observation Y(1),...,Y(n), a least squares line is fitted to the points (X(m),Y(m)),...,(X(n),Y(n)) where m < n may depend on n. The (n+1)st approximation is taken to be the intersection of the least squares line with y = 0. A variation of the resulting process is studied. It is shown that this process yields a strongly consistent sequence of estimates which is asymptotically normal with minimal asymptotic variance.

AD-A027 478/7GA PC$3.50/MF$3.00
Michigan Univ Ann Arbor Dept of Mathematics
Point Arboricity Critical Graphs Exist,
Bela Bollobas, and Frank Harary. 25 Apr 74, 7p AFOSR-TR-76-0627
Grant AF-AFOSR-2502-73
Availability: Pub. in Jnl. of the London Mathematical Society, v2 n12 p97-102 1975.

Descriptors: *Graphs, Theorems, Set theory, Point theorem, Reprints.
Identifiers: *Critical graphs, *Graphical analysis, Point arboricity, Graphical methods, *Graph theory.

The point arboricity of a graph is the minimum number of colours assignable to the points so that no cycle is monochromatic. A graph is called k-critical if it is connected and the removal of any edge reduces the point arboricity from k to k-1. The existence of k-critical graphs of odd order only was established by Kronk and Mitchem. K-critical graphs are constructed of every possible even order. (Author)

AD-A027 479/5GA PC$3.50/MF$3.00
Indiana Univ Research Foundation Bloomington
Runge's Theorem for Parabolic Equations in Two Space Variables,
David Colton. 30 Sep 75, 10p AFOSR-TR-76-0587
Grant AF-AFOSR-2592-74
Availability: Pub. in Proceedings of the Royal Society of Edinburgh, V73A n21 p307-315 1974/75.

Descriptors: *Complex variables, Boundary value problems, Theorems, Operators(Mathematics), Numerical integration, Partial differential equations, Reprints.
Identifiers: *Runge theorem, Space variables, Parabolic differential equations.

Let u be a real valued strong solution defined in a cylindrical domain of a linear second-order parabolic equation in two space variables with entire coefficients. Then it is shown that on compact subsets of its domain of definition u can be approximated arbitrarily closely in the maximum norm by an entire solution of the parabolic equation. (Author)

AD-A027 484/5GA PC$3.50/MF$3.00
Texas Univ At Austin Dept of Electrical Engineering
On the Convergence of Statistical Search,
Luc P. Devroye. 17 Apr 74, 15p AFOSR-TR-76-0586
Grant AF-AFOSR-2371-72
Availability: Pub. in IEEE Transactions on Systems, Man and Cybernetics, vSMC-6 n1 p46-56 Jan 76.

Descriptors: *Statistical functions, Convergence, Random variables, Domains, Search theory, Stochastic processes, Reprints.
Identifiers: Statistical search.

The convergence of statistical (random) search for the minimization of an arbitarary multimodal functional Q(w) is dealt with by using the theorems of convergence of random processes of Braverman and Rozonoer. It is shown that random search can be regarded as a gradient algorithm in the Q-domain. Using this gradient to define the minimum of the functional, the convergence to this minimum is discussed at length. The theorems proved in this paper apply as well to discrete as to continuous optimization problems and as such, the developed technique is competitive with stochastic automata with a variable structure. The optimality of the scheme follows from the convergence in probability of the average performance to the minimum. The freedom in the organization of the search within the boundaries outlined by the conditions of convergence is emphasized. Finally, it is pointed out how various mixed random search and hierarchical search systems fall into the domain of application of the theorems. (Author)

AD-A027 485/2GA PC$3.50/MF$3.00
Yale Univ New Haven Conn Dept of Engineering and Applied Science

Structurally Controllable and Structurally Canonical Systems,
J. P. Corfmat, and A. S. Morse. 14 Aug 75, 4p AFOSR-TR-76-0715
Grant AF-AFOSR-2211-72
Availability: Pub. in IEEE Transactions on Automatic Control, p129-131 Feb 76.

Descriptors: *Control theory, Matrices(Mathematics), Transfer functions, Vector spaces, Information theory, Reprints.

In the present paper the structural controllability of linearly parameterized linear systems is studied. Explicity conditions are presented for determining when such systems are either structurally controllable or structurally canonical.

AD-A027 509/9GA PC$3.50/MF$3.00
California Univ Berkeley Electronics Research Lab
Describing Functions Revisited.
Alistair I. Mees, and Arthur R. Bergen. 13 Mar 74, 7p AFOSR-TR-76-0500
Contract F44620-71-C-0087
Availability: Pub. in IEEE Transactions on Automatic Control, vAC-20 n4 p473-478 Aug 75.

Descriptors: *Functional analysis, Feedback, Nonlinear systems, Oscillation, Reprints.
Identifiers: *Control theory.

The well-known graphical describing function procedure can be simply modified to provide a completely reliable method for predicting whether or not certain kinds of nonlinear feedback system can oscillate. The modified method is easy to use and quantifies, in a natural way, the usual intuitive ideas about describing function reliability. In addition to the usual graphs, the user has to draw a band which measures the amount of uncertainty introduced by the approximations inherent in the method; in return for this extra work; the method gives error bounds for oscillation predictions, as well as ranges of frequency and amplitude over which oscillation is impossible.

AD-A027 511/8GA PC$3.50/MF$3.00
Michigan Univ Ann Arbor Dept of Electrical Engineering
Sensitivity Analysis in Multilinear Systems,
William A. Porter, and Romano M. DeSantis. 20 Nov 74, 17p AFOSR-TR-76-0528
Grants AF-AFOSR-2427-73
Availability: Pub. in International Jnl. for Systems Sciences, v7 n2 p191-205 1976.

Descriptors: *Control theory, Linear systems, Feedback, Perturbations, Optimization, Embedding, Closed loop systems, Operators(Mathematics), Reprints.
Identifiers: Embedding theory, Multilinear systems, *Sensitivity analysis.

The primary objective of this study is to examine the sensitivity properties of a multilinear plant embedded in a feedback structure. As a prelude the existing linear theory is summarized and extended. The bilinear case is then treated in detail. Extrapolation of the multilinear case has been carried out by Porter and DeSantis (1974a). New results include the following: (i) the use of causality structure as a component of sensitivity analysis in closed-loop linear and non-linear systems, (ii) the establishment of terminal equivalence conditions for multilinear plants and multilinear compensators, (iii) the development of a sensitivity operator in the multilinear setting including existence conditions, (iv) extensions of linear results to large parameter perturbations. (Author)

AD-A027 539/6GA PC$3.50/MF$3.00
Yale Univ New Haven Conn Dept of Engineering and Applied Science
Minimal Solutions to Transfer Matrix Equations,
A. S. Morse. 14 Aug 75, 4p AFOSR-TR-76-0716
Grant AF-AFOSR-2211-72
Availability: Pub. in IEEE Transactions on Automatic Control, p131-133 Feb 76.

Descriptors: *Matrices(Mathematics), *Transfer functions, Mathematical models, Control theory, Domains, Reprints.

It is shown that the problem of finding a solution T lambda, of least McMillan degree to the transfer matrix equation T1 lambda = T2 lambda T lambda is in essence equivalent to the problem of finding an (A,B)-invariant subspace of least dimension which contains a given subspace.

AD-A027 541/2GA PC$3.50/MF$3.00
Stanford Univ Calif Dept of Electrical Engineering
Nonlinear Filtering with Counting Observations,
Adrian Segall, Mark H. A. Davis, and Thomas Kailath. 10 Nov 73, 8p AFOSR-TR-76-0613
Contract F44620-69-C-0101
Availability: Pub. in IEEE Transactions on Information Theory, v21 n2 p143-149 Mar 75.

Descriptors: *Stochastic processes, Mathematical filters, Signal processing, Gaussian noise, Counting methods, Reprints.
Identifiers: Martingale theory, *Nonlinear filtering.

Some recent results in martingale theory and the innovations method are applied to obtain the evolution of the conditional mean and conditional density of a process that modulates the rate of a counting process.

AD-A027 542/0GA PC$3.50/MF$3.00
Stanford Univ Calif Dept of Electrical Engineering
Radon-Nikodym Derivatives with Respect to Measures Induced by Discontinuous Independent-Increment Processes,
Adrian Segall, and Thomas Kailath. 16 Apr 73, 17p AFOSR-TR-76-0620
Contracts F44620-69-C-0101, N00014-67-A-0112-0044

Descriptors: *Stochastic processes, Signal processing, White noise, Probability, Statistical samples, Reprints.
Identifiers: Martingales, Likelihood ratio, Radon nikodym derivatives, Signal detection, Estimation theory.

Representation formulas were obtained for the Radon-Nikodym derivatives of measures absolutely continuous with respect to measures induced by processes with stationary independent increments. The proofs of these formulas, which have applications in signal detection and estimation problems, call heavily upon recent results in martingale theory, especially a general formula of Doleans-Dade for the logarithm of a strictly positive martingale in terms of a function measuring its jumps.

AD-A027 693/1GA PC$3.50/MF$3.00
Wisconsin Univ Madison Dept of Statistics
On the Completeness of Minimal Sufficient Statistics with Censored Observations.
G. K. Bhattacharyya , Richard A. Johnson, and K. G. Mehrotra. 1976, 13p AFOSR-TR-76-0733
Grant AF-AFOSR-2363-72

Descriptors: *Statistical analysis, *Life cycle testing, *Nonparametric statistics, *Regression analysis, Ranking, Statistical samples.
Identifiers: *Order statistics, Censored observations, Completeness of data for minimal statistics.

The property of completeness, for the minimal sufficient statistics, is investigated in the context of life testing when the set of observations is censored at a fixed time or at a fixed order statistic. Nonparametric families are shown to retain completeness for the observed order statistics and some implications regarding unbiased estimator and similar tests are presented. Most of the common parametric models fail to possess completeness of minimal sufficient statistics under censored sampling in the one-sample, two-sample and regression situations. (Author)

AD-A027 695/6GA PC$4.00/MF$3.00
Wisconsin Univ Madison Dept of Statistics
Linear Models, Time Series and Outliers, 5: Outliers in Time Series,
Bovas Abraham, and G. E. P. Box. Sep 75, 34p UWIS-DS-75-400, AFOSR-TR-76-0734
Grant AF-AFOSR-2363-72

Descriptors: *Time series analysis, Probability, Bayes theorem, Linear programming, Linear regression analyses, Statistical distributions.
Identifiers: Outliers.

Assuming a linear time series model a Bayesian approach to the outlier problem is used in which with probability 1 alpha a probability is generated by a standard distribution and with probability alpha is generated by an alternative distribution with the same variance but with the mean displaced. The effect of estimation of parameters is studied and consideration is given to the selection of bad values.

AD-A027 707/9GA PC$4.00/MF$3.00
Massachusetts Inst of Tech Cambridge Electronic Systems Lab
The Use of Harmonic Analysis in Suboptimal Estimator Design.
Interim rept.,
Steven I. Marcus, and Alan S. Willsky. 1976, 41p AFOSR-TR-76-0852
Grants AF-AFOSR-2273-72, NSF-GK-42090
Prepared in cooperation with Texas Univ. at Austin. Dept. of Electrical Engineering.

Descriptors: *Harmonic analysis, *Lie groups, *Stochastic processes, Approximation, Estimates, Matrices(Mathematics), Differential equations.
Identifiers: Wiener processes, Stochastic differential equations.

The state extimation problem for bilinear stochastic systems evolving on compact Lie groups and homogeneous spaces is considered. The problem is motivated by some applications involving rotational processes in three dimensions. Then the theory of harmonic analysis on compact Lie groups is used to define assumed density approximations which result in implementable suboptimal estimators for the state of the bilinear system.

AD-A027 714/5GA PC$4.50/MF$3.00
Research Triangle Inst Research Triangle Park N C
Systematic Sampling of Two-Dimensional Surfaces and Related Problems.
Final rept.,
John C. Koop. May 76, 65p AFOSR-TR-76-0834
Contract F44620-75-C-0015

Descriptors: *Sampling, Probability, Estimates, Mathematical models, Random variables, Analysis of variance.

The sampling theory for twenty-one methods of sampling points on a two-dimensional surface, for the purpose of estimating an area of interest, is given in this report. Eleven of those methods involve systematic sampling. Firm results on relative efficiency are available for eight out of the eleven methods of non-syste-

matic sampling. The basic assumption in the sampling theory is that the area of interest is fixed; the basic stochastic element is the sample of points realized through the randomization procedure specific to each method of sampling. The theory is extended to two-stage sampling through an example for aligned systematic sampling. A result on sampling 'lines' with probability proportional to size is given; this relates to the magnitude of the relative variance.

AD-A027 723/6GA PC$4.00/MF$3.00
Wisconsin Univ Madison Dept of Statistics
Sequential Procedures for Detecting Parameter Changes in a Time Series Model,
Michael Bagshaw, and Richard A. Johnson. Sep 75, 31p UWIS-DS-75-422, AFOSR-TR-76-0735
Grant AF-AFOSR-2363-72

Descriptors: *Statistical samples, *Time series analysis, Sequential analysis, Parametric instabilities, Statistical distributions, Forecasting.
Identifiers: Wiener processes, Likelihood ratio, Sequential detection.

Procedures are proposed for monitoring forecast errors in order to detect changes in a time series model. These procedures are based on likelihood ratio statistics which consist of cumulative sums. Both a Wald type sequential scheme and an extension of Page's method are considered. The distributional properties of the statistics are approximated under the assumption that the series follows an integrated autoregressive moving average model. The approximation is based on the limiting Wiener process. An example is also given. (Author)

AD-A027 724/4GA PC$4.00/MF$3.00
Wisconsin Univ Madison Dept of Statistics
Extended Hazard Rate Functions: Properties and Applications,
K. G. Mehrotra, R. A. Johnson, and G. K. Bhattacharyya. Jul 75, 30p UWIS-DS-75-418, AFOSR-TR-76-0732
Grant AF-AFOSR-2363-72

Descriptors: *Statistical functions, Hazards, Theorems, Convergence, Life tests.
Identifiers: *Hazard rate functions.

The concept of hazard rate function is extended to include multiple censoring and the vector parameter situation. Some fundamental moment relations are extablished between these extended hazard rate functions and the score functions. These moment relations are then applied to obtain the exact Fisher information and the locally most powerful rank test for multiple censored samples. (Author)

AD-A027 727/7GA PC$3.50/MF$3.00
California Univ Berkeley Electronics Research Lab
Relaxed Controls and the Convergence of Optimal Control Algorithms,
L. J. Williamson, and E. Polak. 15 Feb 74, 21p ARO-11260.1-M
Contract DAAG29-73-C-0025, Grant NGL-05-003-016
Availability: Pub. in SIAM Jnl. of Control and Optimization, v14 n4 p737-756 Jul 76.

Descriptors: *Control theory, *Algorithms, Convergence, Theorems, Relaxation, Optimization, Integer programming, Reprints.

This paper presents a framework for the study of the convergence properties of optimal control algorithms and illustrates its use by means of two examples. The framework consists of an algorithm prototype with a convergence theorem, together with some results in relaxed controls theory. (Author)

AD-A027 750/9GA PC$3.50/MF$3.00
Louisiana State Univ Baton Rouge Dept of Computer Science
How to Select Controller Modes and Tuning Parameters from Simple Process Models,
Jacob Martin, Jr., Armando B. Corripio, and Cecil L. Smith. 1975, 8p AFOSR-TR-76-0782
Grant AF-AFOSR-2580-74
Availability: Pub. in the Annual Conference Proceedings of the Instrument Society of America, v30 pt3 p717 1975.

Descriptors: *Controllers, *Feedback, *Control theory, *Tuning, Selection, Modes, Precision, Mathematical analysis, Reprints, Correlation techniques.

An approach to the selection of controller modes is presented which is based on a simple model of the process with experimentally determined parameters. The approach fixes the integral and derivative times of the controller, allowing for adjustment of the controller gain to meet any specified performance criteria. Correlations for controller parameters that produce 5% overshoot are presented and shown to be near optimal in terms of the integral of the absolute value of the error. (Author)

AD-A027 752/5GA PC$3.50/MF$3.00
Purdue Univ Lafayette Ind Dept of Statistics
A Comparison of Chi-Square Goodness-of-Fit Tests Based on Approximate Bahadur Slope,
M. C. Spruill. Aug 74, 6p AFOSR-TR-76-0778
Grant AF-AFOSR-2350-72
Availability: Pub. in the Annals of Statistics, v4 n2 p409-412 1976.

Descriptors: *Statistical tests, *Chi square test, Degrees of freedom, Parametric analysis, Matrix displays, Comparison, Reprints.
Identifiers: *Goodness of fit tests.

The Pearson-Fisher chi squared statistic is asymptotically chi-square under the null hypothesis with M - m - 1 degrees of freedom where M = number of cells and m = dimension of parameter. The Chernoff-Lehmann statistic is a weighted sum of chi-squares and the Kambhampati statistic is chi squared with M - 1 degrees of freedom. The approximate Bahadur slopes of the tests based on these statistics are computed. It is shown that the Kambhampati test always dominates the Chernoff-Lehmann and that no such dominance exists between the Pearson-Fisher test and Kambhampati test, or the Pearson-Fisher and Chernoff-Lehmann.

AD-A027 753/3GA PC$3.50/MF$3.00
Michigan Univ Ann Arbor Dept of Aerospace Engineering
A Semigroup Representation of Linear Classes of Causal, Time-Varying, Nonlinear systems,
William L. Root. 1975, 5p AFOSR-TR-76-0776
Grant AF-AFOSR-2328-72
Availability: Pub. in Annual Asilomar Conference on Circuits, Systems, Computers (9th), p238-241 1975.

Descriptors: *Functional analysis, Nonlinear systems, Vector spaces, Input output processing, Banach space, Time dependence, Operators(Mathematics), Truncation, Reprints.
Identifiers: *Semigroup theory, Time varying systems.

From the input-output map of a nonlinear, time-varying, causal system operating for all time, the input-output maps of truncations of the system corresponding to finite observation intervals of fixed duration are formed. Some properties of the trajectories of these truncated systems are presented. Under certain conditions the trajectories for a class of systems are generated by a one-parameter semigroup of operators of class C sub o.

AD-A027 756/6GA PC$5.50/MF$3.00
Brown Univ Providence R I Lefschetz Center for Dynamical Systems
Numerical Solutions of Hereditary Control Problems via an Approximation Technique. Interim rept.,
H. T. Banks, J. A. Burns, E. M. Cliff, and P. R. Thrift. Oct 75, 106p CDS-TR-75-6, AFOSR-TR-76-0855
Grants AF-AFOSR-2078-71, NSF-GP-28931
Prepared in cooperation with Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Mathematics and Dept. of Aerospace and Ocean Engineering.

Descriptors: *Control theory, *Numerical analysis, *Approximation(Mathematics), *Quadratic programming, Differential equations, Optimization, Operations research, Linear systems.
Identifiers: Cost problems.

This report discusses in some detail, numerical results for certain hereditary optimal control problems. The numerical procedures involved are based on the approximation ideas proposed by Banks and Burns. The resulting method is easy to implement and in most cases the convergence of approximate solutions to the actual solutions is quite good. Attention here is restricted to control problems with quadratic payoffs. (Somewhat more general payoffs and linear systems could have been treated.) The main reason for this is the case in demonstrating the computational feasibility of the method. Indeed, for the integral quadratic cost problem treated here the approximate control problem becomes a finite dimensional linear regulator problem which is easily solved numerically via standard techniques. In Section 2 a brief description of the problem and our method is given. Section 3 contains a number of examples which are solved exactly using the maximum principle, and in Section 4 representative numerical details for approximate solutions of these examples along with numerical results for several other examples are presented.

NTIS/PS-76/0636/1GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Control Theory. Volume 2. 1974-July, 1976 (A Bibliography with Abstracts).
Rept. for 1974-Jul 76,
David W. Grooms. Aug 76, 204p*
Supersedes NTIS/PS-75/504, and COM-74-11433.

Descriptors: *Bibliographies, *Control theory, Automatic control, Feedback control, Adaptive systems, Mathematical programming, Economic models, Process control, Stochastic processes, Optimization.
Identifiers: Stochastic control, Estimation theory, Filtering theory.

Recent research is presented on automatic control, stochastic control, and feedback control with multidisciplinary applications. Some of the applications include flight control, production control and process control. (This updated bibliography contains 204 abstracts, 91 of which are new entries to the previous edition.) See also NTIS/PS-75/503, Control Theory, Vol. 1, 1970-1973.

N76-25867/2GA PC$5.00/MF$3.00
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Parameter Estimating State Reconstruction.
E. B. George. Jun 76, 99p NASA-TM-X-73313

Descriptors: Nonlinear systems, *Parameterization, *Steepest descent method, *Systems engineering, Adaptive control, *Control theory, Space shuttles, Test facilities, Vibration tests.

For abstract, see STAR 1416

N76-25874/9GA Not available NTIS
Democritus Nuclear Research Center, Athens (Greece).
Kronecker Product Approach to Pole Shifting by Output Feedback.
P. N. Paraskevopoulos, and R. E. King. Aug 75, 17p DEMO-75/9

Descriptors: *Control theory, Feedback, Linear equations, Matrices (Mathematics), Orthogonality, Poles, Set theory.
Identifiers: Greece, Feedback control.

For abstract, see STAR 1416

N76-25896/4GA PC$6.75/MF$3.00
Rice Univ., Houston, Tex. Inst. for Computer Services and Applications.
Nonparametric Probability Density Estimation by Optimization Theoretic Techniques.
D. W. Scott. Apr 76, 156p NASA-CR-147783, REPT-275-025-023
Contracts NAS9-12776, N00014-75-C-0452

Descriptors: *Density measurement, *Monte Carlo method, *Nonparametric statistics, *Optimal control, Algorithms, Discrete functions, Histograms, Kernel functions, Maximum likelihood estimates.

For abstract, see STAR 1416

N76-25905/0GA Not available NTIS
Joint Inst. for Nuclear Research, Dubna (USSR).
Some Representations of the Conformal Superalgebra.
B. L. Aneva, D. T. Stoyanov, and S. G. Mikohv. 1975, 28p JINR-E2-9098

Descriptors: *Algebra, *Conformal mapping, Scalars, Spinor groups.
Identifiers: USSR.

For abstract, see STAR 1416

12B. Operations Research

AD-A027 315/1GA PC$3.50/MF$3.00
Texas Univ At Austin Dept of Electrical Engineering
Probabilistic Search as a Strategy Selection Procedure,
Luc P. Devroye. 1 Jul 75, 9p AFOSR-TR-76-0710
Grant AF-AFOSR-2371-72
Availability: Pub. in IEEE Transactions on Systems, Man, and Cybernetics, p315-321 Apr 76.

Descriptors: *Search theory, *Probability distribution functions, Stochastic processes, Random variables, Convergence, Reprints.
Identifiers: Asymptotic normality.

An alternative solution to the problem of the selection of the best strategy in a random environment is presented by using a probabilistic search procedure. The asymptotic optimality of the technique is proved, and a brief comparison with stochastic automata with variable structures is made. A specific organization of the optimal search procedure is developed based on continued learning of some statistics of the random environment, and its is shown to be fast-converging, powerful in high noise random environments, and insensitive to search parameter selection. (Author)

AD-A027 440/7GA PC$5.00/MF$3.00
Stanford Univ Calif Systems Optimization Lab
Design of a Linear Programming System for the ILLIAC 4.
Technical rept.,
C. E. Pfefferkorn , and J. A. Tomlin. Apr 76, 90p SOL-76-8, ARO-12215.11-M
Contracts N00014-75-C-0865, DAAC29-74-C-0034

Descriptors: *Linear programming, Mathematical models, Simplex method, Central processing units, Data processing, Digital computers, Algorithms, Matrix displays.
Identifiers: *Illiac 4 computer.

This paper outlines a design for implementing a linear programming system on the ILLIAC IV computer. The central concern is to take advantage of the special features of the ILLIAC IV (64 parallel processing elements, large fast disk memory and relatively small fast core memory) and at the same time to take advantage of the sparsity of real large-scale linear programs and the (mostly serial) methodology which has been developed to exploit this sparsity. This requires both the adaption of existing techniques to a parallel environment and the development of a new parallel techniques for efficient sparse matrix processing. It appears that this can be done successfully and that ILLIAC IV should be able to solve problems considerably larger than those which can be attempted on serial computers. (Author)

AD-A027 473/8GA PC$4.00/MF$3.00
California Univ San Diego La Jolla Dept of Applied Mechanics and Engineering Sciences
An Introduction to Nonlinear Programming-I. Necessary and Sufficient Conditions,
Harold W. Sorenson. 21 May 75, 34p AFOSR-TR-76-0712
Grant AF-AFOSR-2839-75
Availability: Pub. in Comput. and Elect. Engng, v3 n1-C p3-34 1976.

Descriptors: *Nonlinear programming, Optimization, Lagrangian functions, Equations, Problem solving, Reprints.

Parameter optimization problems arise in a wide variety of application. The importance of the general problem has led to the investigation and development of the field of nonlinear programming and of the special classes of these problems such as linear programming. such as linear programming. The study of these problems has reached a sophisticated level and an extensive literature exists, including a number of excellent textbooks. In this and in subsequent articles, the basic results of nonlinear programming are reviewed, developed, and discussed. No attempt is made here to survey the vast literature on the subject but sufficient references are included to provide the reader with a basis for a more detailed study. It is hoped that this series of tutorial articles will make the literature more accessible and will provide a useful perspective on the current status of the field. In this first article, the conditions which a solution must satisfy are discussed. To a lesser extent, conditions are examined which, when satisfied, ensure that a solution has been obtained. The discussion in this article of necessary and sufficient conditions for an optimum provides a basis for the subsequent examination of algorithms which can be used to determine the solution of parameter optimization (i.e. nonlinear programming) problems. (Author)

AD-A027 486/0GA PC$3.50/MF$3.00
California Univ Los Angeles Dept of Engineering Systems
First Order Necessary Conditions for a Class of Differential Games,
R. G. Graham, and C. T. Leondes. 23 Jul 73, 13p AFOSR-TR-76-0714
Grant AF-AFOSR-2166-72
Availability: Pub. in Astronautic Acta, v18(Suppl) p237-247 1974.

Descriptors: *Game theory, Partial differential equations, Matrix games, Hamiltonian functions, Boundary value problems, Reprints.
Identifiers: *Differential games.

First order necessary conditions are derived for a class of differential games involving multiple subarcs, terminal and midpoint constraints, control and state variable discontinuities. The problems of determining optimal solutions when the strategy of the opponent is unknown and perhaps optimal are both treated. The necessary conditions are used to determine optimal solutions in examples involving state variable discontinuities and state variable inequality constraints. (Author)

AD-A027 488/6GA PC$3.50/MF$3.00
Washington Univ Seattle Dept of Mathematics
Lagrange Multipliers for an N-Stage Model in Stochastic Convex Programming.
R. T. Rockafellar. 1974, 9p AFOSR-TR-76-0617
Grant AF-AFOSR-2269-72
Availability: Pub. in Analyse Convexe et Ses Applications, p180-187 Jan 74.

Descriptors: *Mathematical programming, *Decision theory, Lagrangian functions, Information theory, Mathematical models, Reprints.
Identifiers: Stochastic programming, *Convex programming.

Many decision processes are of a sequential nature and made use of information which is revealed progressively through the observation, at various times, of random variables with known distributions. A simple model with discrete stages is presented.

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

AD-A027 531/3GA PC$4.00/MF$3.00
Air Force Rocket Propulsion Lab Edwards AFB Calif
Burners for Disposal of Rocket Propellants.
Final rept. 1973-1975,
John Denker. Jun 76, 47p Rept no. AFRPL-TR-76-2

Descriptors: *Burners, *Solid rocket propellants, *Liquid rocket propellants, Solid wastes, Performance tests, Equipment, Air pollution control equipment, Combustion products, Waste treatment, Scrubbers, Hydrogen chloride, Aluminum compounds, Nitrogen oxides.
Identifiers: *Solid waste disposal, *Liquid waste disposal, Design criteria, Aluminum oxide.

Burners were designed, fabricated and used to dispose of toxic rocket propellants and other materials that are residuals from propulsion research programs conducted by the Air Force Rocket Propulsion Laboratory (AFRPL). Burners were developed to burn liquid oxidizers, liquid fuels, and solid propellants. Burners for the liquid wastes were designed and fabricated by AFRPL using commercially available components including sheet steel, industrial blowers and perforated nickel alloy sheeting. The burner developed for burning solid propellants is a modified ammunition deactivation furnace which was purchased from the Army's ammunition depot at Tooele, Utah. These burners are suitable for operational use in detoxification of rocket propellant research residues. They will be installed in the Toxic Waste Disposal Facility located at the Air Force Rocket Propulsion Laboratory, Edwards AFB, California and used to dispose of the toxic residue from its research programs.

NTIS/PS-76/0658/5GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Cooling Towers (Citations from the NTIS Data Base).
Rept. for 1964-Jul 76,
Audrey S. Hundemann. Aug 76, 171p*
Supersedes NTIS/PS-75/549. See also NTIS/PS-76/0659, and NTIS/PS-76/0660.

Descriptors: *Bibliographies, *Cooling towers, *Nuclear power plants, *Electric power plants, Environmental impacts, Design, Air pollution, Water pollution, Plumes, Atmospheric motion.

Abstracts of Federally-funded research dealing with design and environmental impacts of wet and dry cooling towers are presented. Cooling tower drift instrumentation and thermal and chemical pollution control systems are covered. Most abstracts pertain to cooling towers used in nuclear power plants, with a few abstracts pertaining to cooling towers used in wastewater treatment. (This updated bibliography contains 166 abstracts, 43 of which are new entries to the previous edition.)

NTIS/PS-76/0659/3GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Cooling Towers. Part 1. Design and Performance (Citations from the Engineering Index Data Base).
Rept. for 1970-Jul 76,
Audrey S. Hundemann. Aug 76, 128p*
See also NTIS/PS-76/0658.

Descriptors: *Bibliographies, *Cooling towers, *Nuclear power plants, *Electric power plants, Design, Performance, Mechanical draft cooling towers, Natural draft cooling towers, Optimization.

Abstracts from worldwide research on design and performance of mechanical draft and natural draft wet, dry, and dry-wet combination cooling towers are discussed. Abstracts cover studies on size reduction, corrosion protection, and economic optimization of cooling towers primarily used with nuclear power plants and fossil fuel power plants. A few abstracts pertain to cooling towers used in wastewater treatment. (Contains 121 abstracts) See also NTIS/PS-76/0660, Cooling Towers. Part 2. Environmental Studies.

NTIS/PS-76/0660/1GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Cooling Towers. Part 2. Environmental Studies (Citations from the Engineering Index Data Base).
Rept. for 1970-Jul 76,
Audrey S. Hundemann. Aug 76, 76p*
See also NTIS/PS-76/0658.

Descriptors: *Bibliographies, *Cooling towers, *Nuclear power plants, *Electric power plants, Thermal pollution, Ecology, Plumes, Environmental impacts.

Federally-funded research on thermal, meteorological, and ecological effects associated with cooling towers used primarily by fossil fuel and nuclear power plants are cited. Abstracts cover plume behavior studies, including measurement of airborne particulate concentration, and characterization and management of drift as well as noise pollution and salt deposition effects of vegetation. A few abstracts pertain to environmental effects from cooling towers used in wastewater treatment. (Contains 70 abstracts) See also NTIS/PS-76/0659, Cooling Towers. Part 1. Design and Performance.

N76-25525/6GA PC$4.00/MF$3.00
B & K Engineering, Inc., Towson, Md.
Design and Analysis of a Cryogenic Variable Conductance Axial Grooved Heat Pipe.
Mar 76, 32p NASA-CR-137882, BK008-1009
NASA ORDER A-15056-B

Descriptors: *Axial flow, *Cryogenics, *Heat pipes, Cryogenic fluids, Diodes, Switches, Thermal conductors.

For abstract, see STAR 1416

N76-25795/5GA PC$4.00/MF$3.00
Vought Corp., Dallas, Tex. Systems Div.
Development of a Refrigeration System for Lunar Surface and Spacecraft Applications.
Final Report.
R. J. Copeland. 9 Apr 76, 42p NASA-CR-147761, T122-RP-046
Contract NAS9-9912

Descriptors: *Cooling systems, *Lunar surface vehicles, *Refrigerating machinery, Research and development, *Spacecraft environments, Compressing, Earth orbits, Frozen foods, Heat radiators, Space shuttles, Stirling cycle.

For abstract, see STAR 1416

PB-254 831/1GA PC$6.75/MF$3.00
Hague International, South Portland, Maine.
Low Excess Air, High Performance Combustion System for Marine Boilers.
Final rept.
30 Jun 76, 152p 76R148, MA-RD-920-76045
Contract MA-5-38038
Prepared in cooperation with Foster Wheeler Energy Corp., Livingston, N.J. Marine and Industrial Dept.

Descriptors: *Marine surface propulsion, *Water tube boilers, *Combustion control, Flames, Burners, Control equipment, Circulation, Ducts, Fuel injectors.
Identifiers: *Recirculating burners, *Staged combustion, *Flame stability, *Life cycle costs.

A design study was performed on low excess air combustion systems for a marine boiler having a nominal rating of 100,000 pph at 955 F, 875 psig. Two combustion configurations were selected for detailed evaluation consisting of (a) a staged furnace containing three combustion zones separated by a novel air introduction means, and (b) a conventional furnace configuration with massive recirculation burners. Based on earlier experimental work, excess air levels were predicted at less than 1% and less than 5%, respectively. The principal advantage expected due to low excess air is a reduction in the cost of maintenance and an improvement in overall performance. The staged combustion process offered the additional advantage of uniform velocity and temperature profiles to the superheater. An economic evaluation reveals that for the most cost effective system the initial investment would be recovered in less than three years. The ratio of present worth of future savings over 10 years discounted at 11-1/9%/annum to initial investment was found to be from about 2 to 14 for the most cost effective systems.

PB-255 321/2GA PC$9.25/MF$3.00
Minnesota Energy Agency, St. Paul.
The Chicago Project: Evaluation and Testing of Three Types of Energy Audit Processes for School Buildings.
Feb 76, 280p FEA/D-76/318
Contract FEA-CA-04-50055-00

Descriptors: *School buildings, *Energy conservation, Space heating, Air conditioning, Illuminating, Hot water heating, Ventilating, Insulation, Fuel consumption, Electric power demand, Energy consumption, Monitoring, Computerized simulation, Benefit cost analysis, Cost effectiveness, Recommendations.
Identifiers: Energy use, Electric power consumption.

This report discusses techniques for identifying and alleviating excessive and unnecessary energy use in public schools. Three methods for accomplishing these goals are analyzed. (1) A computer simulation model (PSECS) developed by Educational Facilities Laboratories; (2) the Mini-Audit system developed by the Minnesota Energy Agency; (3) extensive energy use audits (Maxi-Audit) that can be performed by qualified engineering firms.

PB-255 347/7GA PC$4.00/MF$3.00
Mitsubishi Heavy Industries Ltd., Tokyo (Japan).
Prediction of Creep Fatigue Damage in Major Steam Generator Components.
Mitsubishi technical bulletin,
Hisao Haneda, Mamoru Araoka, Katsuya Setoguchi, Jerry D. Fox, and Walter F. Siddall.
May 76, 13p MTB-105

Descriptors: *Boilers, Creep properties, Fatigue(Materials), Fatigue life, Predictions, Japan.

The paper presents sample life consumption charts for several representative thick-walled pressure parts of a utility steam generator. The method to investigate the problem used an elastic-plastic creep analysis of an infinitely long thick-walled cylinder with stress concentration factors. Suggestions for use of these life consumption charts in power plant operation to obtain maximum power plant availability and maneuverability are also presented.

PB-255 488/9GA PC$7.75/MF$3.00
Syracuse Univ., N.Y. Coll. of Engineering.
Commercial Building Unitary Heat Pump System with Solar Heating.
Final rept. 31 Dec 74-31 Oct 75,
Eugene E. Drucker, J. E. LaGraff, W. H. Card, Manus Ucar, and William S. Fleming. 31 Oct 75, 207p NSF-RANN/SE/GI-43895/PR-74-4, NSF/RA/N-75/310
Grants NSF-GI-43895, ERDA-75-S-134
See also PB-244 488.

Descriptors: *Solar space heating, *Solar air conditioning, *Office buildings, *School buildings, Commercial buildings, Schools, Heat pumps, Flat plate collectors, Solar collectors, Hot water heating, Heat transfer, Solar radiation, Heat storage, Cost estimates, Computerized simulation, Computer programs, Performance evaluation, Massachusetts, Minnesota, Virginia, FORTRAN.
Identifiers: Solar water heating, Minneapolis(Minnesota), Alexandria(Virginia), Boston(Massachusetts), SYRSOL computer program, FORTRAN 4 computer program.

An algorithmic computational program has been written for determining the overall performance of a heating and cooling system for a typical school and an office building. The system employs a series of water-to-air heat pumps connected in a closed loop, with a flat plate, water cooled solar collector for heating and a large water storage tank. The computer program includes an economic analysis of the solar assisted system on a 30 year life cycle basis, with interest rate, energy cost and escalation, and solar system cost as basic economic variables. Portions of this document are not fully legible.

13B. Civil Engineering

AD-A027 207/0GA PC$4.50/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss

Application of Ecosystem Modeling Methodologies to Dredged Material Research.
Final rept.,
Ross W. Hall, Howard E. Westerdahl, and Rex L. Eley. Jun 76, 72p Rept no. WES-TR-76-3
Report on Dredged Material Research.

Descriptors: *Waste disposal, *Dredging, *Ecology, Solid wastes, Mathematical models, Spoil, Bioassay, Oxygen, Biological food chains, Interactions, Plankton, Water pollution, Models, Nutrients, Chemical reactions, Simulation.
Identifiers: *Solid waste disposal, *Dredge spoil, Eutrophication, Dissolved oxygen, *Ecosystems, Biological productivity.

The report addresses the applicability of physical and mathematical ecosystem modeling methodologies to environmental problems associated with dredging and disposal operations. Three categories of physical models are discussed: Bioassays, microcosms, and scaled ecosystem models. Mathematical models can be divided into a number of classes, such as those predicting the effect of allochthonous loadings on the dissolved oxygen budget, determining the partitioning and dynamics of chemical constituents, predicting excessive eutrophication and nuisance algal blooms due to high nutrient loadings, and simulating biological population dynamics and ecological interactions.

AD-A027 257/5GA PC$4.50/MF$3.00
Naval Postgraduate School Monterey Calif
Social Cost of Oil Pollution.
Master's thesis,
Hanny Susmono Mudjiardjo. Mar 76, 66p

Descriptors: *Oil pollution, *Decision making, Methodology, Oil spills, Social welfare, Computer programs, Costs, Computerized simulation.
Identifiers: Theses, *Social impact.

The purpose of this thesis is to investigate a method of improving decision making relative to the problems created by oil spillage. Many countries around the world, including Indonesia, are plagued by increasing pollution from these spills. This thesis uses a simulation to consider the spread and damage caused by oil spills using data from San Francisco Bay. A projection of social costs from these spills has been made. Formulation of a methodology for deriving the social cost of oil spills is a prerequisite in reaching optimal, rational decisions in managing oil pollution. Such decisions may include the establishment of a fine structure, determination of the required level of clean-up and identification of socially significant spills. (Author)

AD-A027 339/1GA PC$3.50/MF$3.00
California Inst of Tech Pasadena W M Keck Lab of Hydraulics and Water Resources
Automated Wet Sand Feeder for Open-Circuit Flumes,
Robert P. Sharp, Elton F. Daly, and Michael G. Foley. 12 May 75, 4p ARO-11908.1-GS
Grants DAHC04-74-G-0189, NSF-GK-31802
Availability: Pub. in Jnl. of the Hydraulics Div., Proceedings of the American Society of Civil Engineers, v102 nHY1 p136-138 Jan 76.

Descriptors: *Sediment transport, *Sand, Simulation, Automation, Computer programs, Reprints.
Identifiers: *Flumes.

Movable-bed sediment transport experiments in open-circuit flumes require that sand be fed into the flume inlet. Previous sand feeders have required the use of dry sand for accurate input rates. Sand recovery and reuse is necessary in open-circuit simulated-flood experiments now in progress in the W. M. Keck Hydraulics Laboratory, Pasadena, Calif., because of the high transport rates used, the large amount of sand recycled makes drying between experiments impractical, requiring that the recovered sand be fed wet. This paper describes the programmable wet sand feeder developed for these experiments. (Author)

AD-A027 387/0GA PC$4.00/MF$3.00
Geological Survey Pittsburgh Pa Water Resources Div
Preimpoundment Water Quality of Raystown Branch Juniata River and Six Tributary Streams, South-Central Pennsylvania.
Water-resources investigations Jul 72-Mar 75,
Donald R. Williams. Jun 76, 30p Rept nos. USGS/WRD/WRI-76/043, USGS/WRI-76-57
Prepared in cooperation with Corps of Engineers, Baltimore, Md. Baltimore District.

Descriptors: *Watersheds, *Water quality, Pennsylvania, Nitrates, Phosphates, Seasonal variations, Lakes, Gases, Oxygen, Coliform bacteria, Reservoirs, Limnology.
Identifiers: Juniata River, Raystown Lake.

The Raystown Branch Juniata River watershed, which is the main water source for Raystown Lake, is a 960-square-mile drainage basin in south-central Pennsylvania. Preimpoundment water-quality data were collected on the Raystown Branch and six tributary streams in the basin. Specific conductance values varied inversely with water discharge. The pH values were extremely low only at the Shoup Run site. Dissolved oxygen concentrations observed at all sites indicated a relatively high oxygen saturation level throughout the year. Seasonal variations in nitrate-N and orthophosphate-P levels were measured at the main inflow station at Saxton, Pa. Bacteriological data indicated no excessive amounts of fecal matter present at the inflows. Soil samples collected at four sites in the impoundment area were predominantly of the Barbour, Philo, and Basher series, which are considered to be highly fertile soils with silt-loam and sandy-loam textures. Morphological features of the lake basin and low nutrient levels at the inflows should prevent excessive weed growth around the lake perimeter.

AD-A027 405/0GA PC$3.50/MF$3.00
Cold Regions Research and Engineering Lab Hanover N H
Thermal Pollution Studies of French Creek, Eielson AFB, Alaska,
Terry McFadden. Jun 76, 9p Rept no. CRREL-76-14

Descriptors: *Thermal pollution, *Streams, Temperature, Electric power production, Summer, Hot water, Alaska, Environmental tests, Thermocouples.
Identifiers: French Creek, Eielson Air Force Base.

At the height of warm weather in Alaska in 1975, temperature measurements were made to determine the extent of the thermal impact on French Creek due to a condenser cooling water impact from the Eielson AFB Power plant. Water temperature measurements during a two-day period failed to show any significant thermal impact on the water in French Creek. It was concluded that no thermal pollution exists due to this warm water input at the volumes and conditions that presently exist. (Author)

AD-A027 431/8GA PC$5.00/MF$3.00
Construction Engineering Research Lab (Army) Champaign Ill
Computer-Aided Environmental Impact Analysis for Air Force Base Realignment Activities: User Manual.
Final rept.,
R. E. Riggins, and R. K. Jain. Jun 76, 77p Rept no. CERL-TR-N-4

Descriptors: *Computer aided design, *Airports, Environmental impact statements, Air Force facilities, Air Force planning, Computer applications, Military organizations, Manuals, Assessment, Environments.
Identifiers: Environmental impact computer systems, Environmental impact assessments, Assessment centers, Air Force bases, *Environmental surveys.

The federal governments has requested that its agencies incorporate environmental considerations into the planning of new projects and activities. Environmental impact assessments and statements (EIA/EIS) provide a basis for review and analysis of a proposed project's environmental consequences. The Environmental Impact Computer System (EICS), developed by the U.S. Army Construction Engineering Research Laboratory, helps planners efficiently identify primary and secondary impacts of their proposed projects or activities and suggests ways to mitigate these impacts. This manual is designed to help Air Force personnel prepare EIAs and EISs using the EICS. Detailed instructions for accessing the mission change functional area of EICS are included as is an input form necessary for obtaining EICS output. The manual discusses in detail procedures necessary for using EICS output for environmental impact assessment and outlines the steps for preparing a proper and complete EIA/EIS. (Author)

AD-A027 437/3GA PC$4.50/MF$3.00
Southwest Research Inst San Antonio Tex Army Fuels and Lubricants Research Lab
Liaison Services on State/Municipal Regulations for Mobile Sources.
Final rept. Jul 75-Jun 76,
J. A. Russell, H. M. Marbach, and J. D. Tosh. Jun 76, 70p Rept no. AFLRL-78
Contract DAAG53-75-C-0148

Descriptors: *Air pollution, *Noise pollution, *Military vehicles, Air quality, State government, Maintenance, Operational readiness, Advisory activities, Municipalities, Manuals, Automobile exhaust, Federal law, Regulations.
Identifiers: Environmental Protection Agency, Liaison.

This report briefly describes the steps and functions incident to generation of a recently-issued USATACOM field document, State Regulations Summary, Mobile Ground Sources: Emissions-Maintenance-Inspection, which was prepared under the subject contract. Format, content, and intended functional use of the document are described; key excerpt material is included. (Author)

AD-A027 708/7GA PC$10.00/MF$3.00
Cold Regions Research and Engineering Lab Hanover N H
Chemistry and Microbiology of Water,
L. B. Dolivo-Dobrovolskii, L. A. Kulskii, and V. F. Nakorchevskaya. 1975, 343p Rept no. CRREL-TL-506
Draft trans. of mono. Khimiia i Mikrobiologiia Vody, Kiev, 1971 306p.

Descriptors: *Sewage treatment, *Water treatment, *Water chemistry, Solubility, Sorption, Surfaces, Colloids, Surface waters, USSR, Physical properties, Chemical properties, Water analysis, Translations, Taste, Iron, Manganese, Chlorine, Silver, Iodine, Ultraviolet radiation, Ultrasonic radiation, Radioactive isotopes, Microorganisms, Bacteria.
Identifiers: Water pollution control, Chemical removal(Water treatment), Chemical removal(Sewage treatment), Solutions, Micelles, Industrial waste treatment, Coagulants, Water softening, Odor, Desalting, Dissolved gases, Inorganic silicates, Degassing, Disinfectants, Ozonization, Radioactive effluents, Urban, Municipal engineering, Irrigated land, Lagoons(Ponds).

The book discusses the chemical and microbiological processes taking place in reservoirs, tanks and ponds, and during purification of natural and sewage waters. Particular attention is devoted to problems of chemical and biological purification, in tensification of the methods of treating natural and sewage waters, new reagents and improvement of the treatment method. The textbook is designed for students at engineering-construction institutes with the specialty of 'Water Supply and Sewage Systems'. It will also be useful to engineering and technical personnel in studying, planning and operating water lines and sewage purification installations.

NTIS/PS-76/0593/4GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Flood Control. Volume 1. 1964-1974 (A Bibliography with Abstracts).
Rept. for 1964-74,
Robena J. Brown. Jul 76, 229p*

Descriptors: *Bibliographies, *Flood control, Flood plains, Hydrology, Regional planning, Flood forecasting, Flood plain zoning, River basins, Urban areas, Mathematical models, Water pollution, Policies, Reservoirs.

Research studies are presented involving floods as related to control, forecasting, warning systems, urban planning, prevention, zoning, urbanization, and land use management. Flood control studies for specific towns and reports generated by the Army Engineers which deal with specific areas have been excluded. (This updated bibliography contains 224 abstracts, none of which are new.)

NTIS/PS-76/0594/2GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Flood Control. Volume 2. 1975-1976 (A Bibliography with Abstracts).
Rept. for 1975-76,
Robena J. Brown. Jul 76, 143p*
Supersedes NTIS/PS-75/552, and COM-74-11201.

Descriptors: *Bibliographies, *Flood control, Flood forecasting, Urban planning, Regional planning, Land use, Methodology, Flood plain zoning, Management, Projects, Ordinances, Research, Hydrology, Water pollution, Policies, River basins, Reservoirs.

Research studies are presented involving floods as related to control, forecasting, urban planning, prevention, zoning, urbanization, and land use management. Flood control studies for specific towns and reports generated by the Army Engineers which deal with specific areas have been excluded. (This updated bibliography contains 138 abstracts, 104 of which are new entries to the previous edition.) See also NTIS/PS-76/0593, Flood Control. Vol. 1. 1964-1974.

NTIS/PS-76/0622/1GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Transportation for the Elderly or Physically Handicapped (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Mary E. Young. Aug 76, 88p*
Supersedes NTIS/PS-75/575, and COM-74-10887.

Descriptors: *Bibliographies, *Passenger transportation, *Handicapped persons, *Elderly persons, Transportation management, Urban transportation, Travel, Regional planning, Rural areas, Problem solving, Services, Barriers.
Identifiers: Transportation for the aged, Transportation for the handicapped, Transit riders.

Reports on planning public transportation for elderly persons or those persons who are physically disabled are cited. Studies are included of difficulties encountered, special design, and real and potential use of facilities. (This updated bibliography contains 83 abstracts, 58 of which are new entries to the previous edition.)

NTIS/PS-76/0625/4GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Airport Noise (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Guy E. Habercom, Jr. Aug 76, 177p*
Supersedes NTIS/PS-75/530.

Descriptors: *Bibliographies, *Airports, *Aircraft noise, *Noise pollution, Noise exposure, Noise abatement, Noise reduction, Physiological effects, Urban planning, Air traffic, Abstracts.
Identifiers: *Preferential runway systems.

Aircraft created noise, noise intensity, noise exposure, and physiological effects, all in airport environments, are investigated in these research reports. (This updated bibliography contains 172 abstracts, 34 of which are new entries to the previous edition.)

NTIS/PS-76/0626/2GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Offshore Structures (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Guy E. Habercom, Jr. Aug 76, 155p*
Supersedes NTIS/PS-75/684, and NTIS/PS-74/123.

Descriptors: *Bibliographies, *Offshore structures, Site surveys, Ocean environments, Urban planning, Marine terminals, Environmental surveys, Nuclear power plants.
Identifiers: *Floating cities, *Offshore airports.

Offshore structures are investigated relative to their feasibility, design, construction, marine environments, and environmental impact. Nuclear power plants, floating cities, and airports are among the facilities included in the feasibility studies. (This updated bibliography contains 150 abstracts, 84 of which are new entries to the previous edition.) See also NTIS/PS-76/0627, Offshore Drilling.

NTIS/PS-76/0633/8GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Wastewater Effluent Guidelines and Performance Standards Using Best Technology (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Edward J. Lehmann. Aug 76, 136p*

Descriptors: *Bibliographies, *Industrial waste treatment, *Water pollution abatement, *Sewage treatment, Standards, Economic impact, Environmental impacts, River basins, Industries, Cost analysis, Economic factors, Rivers.
Identifiers: *Best technology, *Federal Water Pollution Control Act Amendments of 1972, Water pollution economics.

The reports cited describe wastewater effluent limitation guidelines and their development, standards of performance, and pretreatment standards for industries, so that they may implement sections of the Federal Water Pollution Control Act Amendments of 1972. Effluent limitations guidelines are set forth for the degree of effluent reduction attainable through the application of the 'Best Practicable Control Technology Currently Available', and the 'Best Available Technology Economically Achievable', which must be achieved by existing point sources by July 1, 1977 and July 1, 1983 respectively. Also included are studies on the economic and environmental impacts of these guidelines on industries and their surroundings. (Contains 131 abstracts)

NTIS/PS-76/0637/9GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Oil Spill Removal Techniques and Equipment (A Bibliography with Abstracts).
Rept. for 1965-Jun 76,
Mona F. Smith. Aug 76, 252p*
Supersedes NTIS/PS-75/542, and COM-74-10951.

Descriptors: *Bibliographies, *Oil pollution, *Water pollution control, Skimmers, Booms(Equipment), Cleaning, Coalescing, Dispersing, Separation, Absorption, Materials recovery, Flotation, Combustion, Tests, Oil spills, Barriers, Ocean waves, Abstracts.
Identifiers: Oil water separators, *Oil pollution removal, Oil spills.

The removal processes cover oil water separators, skimmers, dispersants, adsorbents, flotation and combustion. Related studies on oil spreading, droplet entrainment, prototype removal systems, equipment and costs are also presented. Oil water separators designed only for tanker ballast water cleaning have not been included. (This updated bibliography contains 247 abstracts, 45 of which are new entries to the previous edition.) See also NTIS/PS-76/0032, Biodeterioration of Oil Spills.

NTIS/PS-76/0638/7GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Air Quality Monitoring. Volume 1. 1970-1974 (A Bibliography with Abstracts).
Rept. for 1970-74,
Edward J. Lehmann, and Diane M. Cavagnaro. Aug 76, 156p*

Descriptors: *Bibliographies, *Monitors, Nitrogen oxides, Sulfur oxides, Air pollution, Combustion products, Carbon monoxide, Carbon dioxide, Particles, Remote sensing, Gas sampling, Design criteria, Hydrocarbons, Exhaust emissions, Industrial wastes, Calibration, Performance evaluation, Urban planning, Aerosols.
Identifiers: *Air pollution sampling.

The selected research covers various aspects of air pollution monitoring including sensor design, site selection, operation criteria, and calibration. (This updated bibliography contains 151 abstracts, none of which are new entries to the previous edition.)

NTIS/PS-76/0639/5GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Air Quality Monitoring. Volume 2. 1975-July 1976 (A Bibliography with Abstracts).
Rept. for 1975-Jul 76,
Diane M. Cavagnaro. Aug 76, 241p*
Supersedes NTIS/PS-75/529, and COM-74-11360.

Descriptors: *Bibliographies, *Monitors, Nitrogen oxides, Sulfur oxides, Air pollution, Combustion products, Carbon monoxide, Carbon dioxide, Particles, Remote sensing, Gas sampling, Design criteria, Hydrocarbons, Ex-

haust emissions, Industrial wastes, Calibrating, Performance evaluation, Urban planning, Aerosols.
Identifiers: *Air pollution sampling.

The bibliography cites major studies on air pollution monitoring, including site selection, operation criteria, design criteria, calibration, and the performance evaluation of the technique or equipment. The monitoring of all types of pollutants from various sources is covered. (This updated bibliography contains 236 abstracts, 206 of which are new entries to the previous edition.) See also NTIS/PS-76/0638, Air Quality Monitoring, Vol. 1. 1970-1975.

NTIS/PS-76/0646/3GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Water Rights and Water Law. Volume 2. 1974-July, 1976 (A Bibliography with Abstracts).
Rept. for 1974-Jul 76,
Robena J. Brown. Aug 76, 162p*
Supersedes NTIS/PS-75/558, and NTIS/PS-74/099.

Descriptors: *Bibliographies, *Water rights, *Water law, Water resources, Legislation, Law(Jurisprudence), Water management, Water quality, Water supply, Litigation, Abstracts.

Legal aspects of interstate and intrastate water rights, water quality, and water management are investigated in these research reports. (This updated bibliography contains 157 abstracts, 56 of which are new entries to the previous edition.) See also NTIS/PS-75/559, Water Rights and Water Law. Vol. 1. 1964-1973.

NTIS/PS-76/0647/0GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Tunnel Construction (Citations from the NTIS Data Base).
Rept. for 1964-Jul 76,
Guy E. Habercom, Jr. Aug 76, 250p*
Supersedes NTIS/PS-75/550, NTIS/PS-74/096, and COM-73-11390. See also NTIS/PS-76/0648, NTIS/PS-76/0649, NTIS/PS-76/0650, and NTIS/PS-76/0651.

Descriptors: *Bibliographies, *Tunnel construction, *Tunneling(Excavation), Tunneling machines, Tunnel linings, Cost analysis, Rock properties, Underground supporting, Finite element analysis, Abstracts.
Identifiers: *Tunnel supports.

Unique tunneling methods, cost studies, tunnel support innovations, tunneling machines, and soil and rock properties encountered are investigated in these Government-sponsored research reports. Vehicular, water, sewage, and mine tunnels are reviewed. Finite element analysis is used extensively for investigation of soil and rock mechanics. (This updated bibliography contains 245 abstracts, 85 of which are new entries to the previous edition.)

NTIS/PS-76/0648/6GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Tunnel Construction. Volume 1. 1970-1972 (Citations from the Engineering Index Data Base).
Rept. for 1970-72,
Guy E. Habercom, Jr. Aug 76, 261p*
See also NTIS/PS-76/0647.

Descriptors: *Bibliographies, *Tunnel construction, *Tunneling(Excavation), Tunneling machines, Tunnel linings, Cost analysis, Rock properties, Underground supporting, Finite element analysis, Abstracts.
Identifiers: *Tunnel supports.

Unique tunneling methods, cost studies, tunnel support innovations, tunneling machines, and soil and rock properties encountered are investigated in these reports gathered in a worldwide literature survey. Vehicular, water, sewage, and mine tunnels are reviewed. Finite element analysis is used extensively for investigation of soil and rock mechanics. (Contains 256 abstracts)

NTIS/PS-76/0649/4GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Tunnel Construction. Volume 2. 1973-1974 (Citations from the Engineering Index Data Base).
Rept. for 1973-74,
Guy E. Habercom, Jr. Aug 76, 179p*
See also NTIS/PS-76/0647.

Descriptors: *Bibliographies, *Tunnel construction, *Tunneling(Excavation), Tunneling machines, Tunnel linings, Cost analysis, Rock properties, Underground supporting, Finite element analysis, Abstracts.
Identifiers: *Tunnel supports.

Unique tunneling methods, cost studies, tunnel support innovations, tunneling machines, and soil and rock properties encountered are investigated in these reports gathered in a worldwide literature survey. Vehicular, water, sewage, and mine tunnels are reviewed. Finite element analysis is used extensively for investigation of soil and rock mechanics. (Contains 172 abstracts)

NTIS/PS-76/0650/2GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Tunnel Construction. Volume 3. 1975 (Citations from the Engineering Index Data Base).
Rept. for 1975,
Guy E. Habercom, Jr. Aug 76, 201p*
See also NTIS/PS-76/0647.

Descriptors: *Bibliographies, *Tunnel construction, *Tunneling(Excavation), Tunneling machines, Tunnel linings, Cost analysis, Rock properties, Underground supporting, Finite element analysis, Abstracts.
Identifiers: *Tunnel supports.

Unique tunneling methods, cost studies, tunnel support innovations, tunneling machines, and soil and rock properties encountered are investigated in these reports gathered in a worldwide literature survey. Vehicular, water, sewage, and mine tunnels are reviewed. Finite element analysis is used extensively for investigation of soil and rock mechanics. (Contains 194 abstracts)

NTIS/PS-76/0651/0GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Tunnel Construction. Volume 4. 1976 (Citations from the Engineering Index Data Base).
Rept. for 1976,
Guy E. Habercom, Jr. Aug 76, 63p*
See also NTIS/PS-76/0647.

Descriptors: *Bibliographies, *Tunnel construction, *Tunneling(Excavation), Tunneling machines, Tunnel linings, Cost analysis, Rock properties, Underground supporting, Finite element analysis, Abstracts.
Identifiers: *Tunnel supports.

Unique tunneling methods, cost studies, tunnel support innovations, tunneling machines, and soil and rock properties encountered are investigated in these reports gathered in a worldwide literature survey. Vehicular, water, sewage, and mine tunnels are reviewed. Finite element analysis is used extensively for investigation of soil and rock mechanics. (Contains 56 abstracts)

NTISUB/B/126-76/007 PC$10.00/MF$10.00
Environmental Protection Agency, Washington, D.C. Grants Administration Div.
Wastewater Treatment Construction Grants Data Base. Public Law 92-500 Project Records. Grants Assistance Programs. New Projects Funded During June, 1976.
Aug 76, 348p* EPA/GAD/2-76/007
See also NTISUB/B/126-76/006.
Paper copy also available on subscription, North American Continent price $100.00/year; all others write for quote.

Descriptors: *Sewage treatment, *Water pollution control, *Grants, *Industrial waste treatment, States(United States), Facilities, Construction, Surveys, Federal assistance programs.
Identifiers: *Sewage treatment plants.

Awards for wastewater treatment facilities under Public Law 92-500 are listed on a monthly basis. This publication provides the essential information on all awards made during the month listed. The awards are sorted by state and the information provided is applicant identification, grant number, grant title, award date, award amount, grant step such as one-planning, two-design, three-construction, description of facility to be constructed and other data.

NTISUB/B/126-76/008 PC$10.00/MF$10.00
Environmental Protection Agency, Washington, D.C. Grants Administration Div.
Wastewater Treatment Construction Grants Data Base. Public Law 92-500 Project Records. Grants Assistance Program. New Projects Funded During July, 1976.
17 Aug 76, 89p* EPA/GAD/2-76/008
See also NTISUB/B/126-76/007.
Paper copy also available on subscription, North American Continent price $100.00/year; all others write for quote.

Descriptors: *Sewage treatment, *Industrial waste treatment, *Water pollution control, *Grants, Industrial plants, Construction, States(United States).
Identifiers: *Sewage treatment plants, Priorities.

Awards for wastewater treatment facilities under Public Law 92-500 are listed on a monthly basis. This publication provides the essential information on all awards made during the month listed. The awards are sorted by state and the information provided is applicant identification, grant number, grant title, award date, award amount, grant step such as one-planning, two design, three-construction, description of facility to be constructed and other data.

N76-25683/3GA PC$4.00/MF$3.00
Old Dominion Univ. Research Foundation, Norfolk, Va. Dept. of Physics and Geophysical Sciences.
Software for Digital Acquisition System and Application to Environmental Monitoring.
G. E. Copeland, and E. C. Kindle. Nov 75, 46p
NASA-CR-148140, PGS-TR-AP-75-15
Contract NGL-47-003-067

Descriptors: *Air pollution, *Computer programs, *Data acquisition, *Environmental monitoring, *Minicomputers, Carbon monoxide, Computer systems design, Hydrocarbons, Meteorological parameters, Nitrogen oxides, Ozone, Sulfur compounds.
Identifiers: MONARCH computer program.

For abstract, see STAR 1416

N76-25684/1GA PC$4.00/MF$3.00
Old Dominion Univ. Research Foundation, Norfolk, Va. Dept. of Physics and Geophysical Sciences.
Analysis of Impact of Busch Gardens Expansion on Air Quality of Surrounding Area.
E. C. Kindle, G. Maier, and G. E. Copeland. Nov 75, 27p NASA-CR-148139, PGS-TR-AP-75-17
Contract NGL-47-003-067

Descriptors: *Air pollution, *Air quality, *Environmental surveys, *Parks, *Recreation, Virginia, Air sampling, Carbon monoxide, Colorimetry, Exhaust gases, Hydrocarbons, Infrared detectors, Meteorological parameters, Parking, Traffic.
Identifiers: Busch Gardens(Virginia).

For abstract, see STAR 1416

N76-25705/4GA PC$3.50/MF$3.00
Old Dominion Univ. Research Foundation, Norfolk, Va. Dept. of Physics and Geophysical Sciences.
Ambient Atmospheric Hydrocarbon Content as Determined by Gas Chromatographic Techniques for Rural Tidewater Virginia in Late Spring 1974.
G. E. Copeland, R. Davis, P. Maroulis, A. R. Bandy, and R. Denyszyn. Nov 75, 13p NASA-CR-148141, PGS-TR-AP-75-14
Contract NGL-47-003-067

Descriptors: *Atmospheric composition, *Hydrocarbons, *Rural areas, *Virginia, *Air quality, Air sampling, Concentration (Composition), Marshlands, Standards.
Identifiers: Tidewater(Virginia), Air quality data.

For abstract, see STAR 1416

PAT-APPL-688 859/GA PC$3.50/MF$3.00
Department of the Interior, Washington, D.C.
Method for Rapid Sedimentation of Fine Particles from Suspensions.
Patent Application,
Annie G. Smalley, and Charles Spruiell, Jr. Filed 21 May 76, 12p PB-255 382/4, DOCKET/MIN-2443
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Particles, *Sedimentation, *Water pollution control, Filtration, Chemical reactions, Fines, Phosphate deposits, Chemical removal(Water treatment), Hydrofluoric acid, Minerals.
Identifiers: Phosphate rock slime, Phosphate removal.

Suspensions of fine particles such as phosphate ore slimes are caused to settle by reaction with hydrofluoric acid or equivalent F-containing material in order to effect rapid settling of particles from the aqueous suspensions. This patent application can be used for water pollution control.

PATENT-3 958 637 Not available NTIS
Department of the Interior, Washington, D.C.
Technique for Lining Shaft.
Patent,
James H. Cobbs. Filed 22 May 75, patented 25 May 76, 7p PB-255 372/5, PAT-APPL-580 111
Supersedes PB-245 393.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Boreholes, *Linings, *Slip castings, *Patents, Slip forms, Concrete construction.
Identifiers: PAT-CL-166-287.

The patent relates to a method and apparatus for lining large diameter, deep, boreholes in the earth, which provides a relatively thick lining of cement. A slip form is provided having a cylindrical outer wall of the diameter corresponding to the desired inner diameter of the liner. This is supported on a long central pipe through which cement can be pumped through side pipes and through openings in the wall of the slip form. A base unit is provided with an internal diameter substantially equal to that of the slip form. A petal basket of flexible material is not provided to seal against the wall of the borehole. The slip form is attached to the base by means of shear pins, and the assembly lowered into the borehole until the base is on bottom. Cement is pumped down through the central pipe and out through the openings in the slip form to form a cement liner between the slip form, the base, and the wall of the borehole. When the cement reaches a first set, the slip form is lifted, breaking the shear pins. Cement is then pumped through the upper set of openings and the slip form is raised at a slow controlled rate, so that there is always support for the cement at the lowest part of the slip form, so that it has a residence time at least sufficient to reach that first set, before the slip form moves up. This process is continued until the complete liner is in place.

PATENT-3 958 650 Not available NTIS
Department of the Interior, Washington, D.C.
Drilling System Using Weight of Mud.
Patent,
James H. Cobbs, and Roger J. Morrell. Filed 28 May 75, patented 25 May 76, 6p PB-255 371/7, PAT-APPL-581 408
Supersedes PB-245 395.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Boreholes, *Rotary drill bits, *Patents, Drill pipes, Drilling fluids, Rock drills, Orifices, Differential pressure.
Identifiers: PAT-CL-175-205.

The patent relates to a drill system for drilling very large holes in the earth, of diameters up to from 10 to 20 feet, by means of a rotary bit carrying a plurality of cutters, wherein the bit assembly is pressed against the bottom of the hole, so that the unit pressure against each of the cutters will be adequate for their optimum performance. The force holding the bit in contact with the bottom of the hole is created by the weight of the drilling liquid on top of the bit. A fluid seal is maintained between the outer edge of the bit and the wall of the bore hole. Liquid flows down the annulus around the drill pipe and through a plurality of orifices in the bit, terminating at the bit cutters. Rock cuttings are washed radially inwardly to a central drill pipe, which supports the bit, and through which torque is applied to the bit. The pressure drop in the orifices serves to create a differential pressure above and below the bit. The differential pressure times the exposed surface area of the bit provides the hold down force. Cuttings are lifted out of the central drill pipe by means of a smaller diameter pipe lowered inside of the drill pipe, through which compressed air is applied.

PB-254 578-T/GA PC$4.50/MF$3.00
Environmental Protection Agency, Research Triangle Park, N.C. Translation Services Section.
Purification of Smokestack Gases of an Electrical Generating Station of Sulfur Dioxide Using the Magnesite Method.
1975, 62p EPA-TR-76-4
Trans. of mono. Ochistka Dymouykh Gazov Elektrostantsii ot Sernistogo Angidrida Magnezitovym Metodom, Moscow, 1975.

Descriptors: *Air pollution control, *Sulfur dioxide, *Gas analysis, Viscosity, USSR, Translations, Flue gases, Sulfur oxides, Density(Mass/volume), Gravimetric analysis, Concentration(Composition), Acidity, Magnesium oxides, Magnesium sulfates, Sampling, Reagents, Sediments, Cystal structure, pH.
Identifiers: *Air pollution detection.

Contents:
- Methods of Testing;
- The Plan of Upcoming Operations;
- Methods of Analytical and Physico-Chemical Control of the Devices for Extracting Sulfur Dioxide Using the Magnesite Method;
- Analysis of the Gas;
- Determination of S:
- L (of volume);
- Determining S:
- L (gravimetric);
- Determining the Gravimetric Content of the Solid Phase in the Suspension;
- Determining Acidity (pH) of the Operating Suspension and the Solution;
- Determining Density;
- Determining Viscosity;
- Analysis of the Solutions;
- Analysis of the Solid Phase (Crystals);
- Analysis of the Magnesite;
- Analysis of the Sediment;
- Preparing the Reagents.

PB-254 758/6GA PC$7.75/MF$3.00
PRC Systems Sciences Co., McLean, Va.
Analysis of Major Short-Haul Transportation Problems.
Final rept.,
B. Rogstad, J. Berterman, A. Dobson, G. Grainger, and K. O'Leary. Nov 71, 211p
DOT/TST-76-76
Contract DOT-OS-10197

Descriptors: *Transportation, Economic analysis, Air pollution, Noise pollution, Traffic safety, Energy conservation, Research management, Noise reduction, Rail transportation, Short takeoff aircraft, Vertical takeoff aircraft, Aviation safety.
Identifiers: *Short haul transportation, Multimodal transportation, Tracked air cushion vehicles.

The report examines five major problems in short-haul transportation: break-even analysis, noise, energy, air pollution, and safety. The break-even analysis is applied to both new and existing ground and air systems including TACV, improved rail, autotrain, bus, CTOL, VTOL, and STOL. The noise analysis includes a survey of existing transportation noise impacts, as well as a noise mapping analysis of proposed passenger systems. The noise chapter identifies R&D opportunities and makes recommendations on governmental noise policy. The energy chapter examines energy resources, consumption, and transportation energy efficiencies, and identifies R&D opportunities with particular emphasis on transportation-related opportunities. The air pollution chapter compares current and forecast future emission levels for three modes: TACV, automobile, and CTOL. Transportation safety is examined historically in terms of highway, rail, and aviation safety, and R&D opportunities are identified.

PB-254 807/1GA PC$4.50/MF$3.00
Colorado Div. of Highways, Denver. Planning and Research Div.
The Effect of Vibration on the Durability of Unreinforced Concrete Pavement.
Final rept.,
Burrell B. Gerhardt. 23 May 75, 69p CDOH-P/R-R/SS-75-2, FHWA/CO/RD-75/2

Descriptors: *Concrete pavements, *Concrete durability, Vibration, Consolidation, Air entrainment, Water cement ratio, Vibratory compacting, Wear resistance, Colorado.

Because a noticeable difference in durability of concrete pavements in Colorado seemed to be associated with differences in consolidation and void content of the concrete, an effort was made to determine the relationship. After extensive laboratory work to determine the basic characteristics of the designed mixes, test sections were layed out at four different locations. These test sections had internal vibration by vibrators having various diameter eccentrics and vibration speeds. In addition, the angle of the vibrators was changed, as was the height of the vibrators, the paver speed and the slump of the mixes. Performance of these test sections was observed from May 1970 until May 1975. Wear in the wheel paths due to studded tires has been approximately 0.1 inch per year in the heavily traveled non test areas of the experimental sections. Wear in the test sections has averaged 0.07 inch per year, but it has not varied directly with the consolidation effort. Although there is statistical evidence to indicate that good field control and reasonable vibration will assure at least 97% consolidation and sound concrete, there does not seem to be a direct relationship between vibration effort and resistance to surface abrasion. Other factors such as curing, mix design, water cement ratio at the surface and aggregate type appear to control surface hardness.

PB-254 819/6GA PC$5.00/MF$3.00
Utah Dept. of Transportation, Salt Lake City. Research and Development Unit.
Improvement of Utah's Flexible Pavement Performance System.
Final rept.,
Douglas I. Anderson, Dale E. Peterson, and L. Wayne Shepherd. Mar 76, 98p UDOT-MR-76-1, Utah-RR-500-925
Prepared in cooperation with Federal Highway Administration, Washington, D.C.

Descriptors: *Flexible pavements, *Maintenance, Temperature gradients, Surface temperature, Traffic surveys, Skid resistance, Deflection, Utah.

A study was made of Utah's Flexible Pavement Performance System to introduce new methods, and to increase the accuracy of the output. The terminal serviceability relationship was revised to consider not only functional class but also average daily traffic. Parameters related to the shape of the deflection basin were reviewed, and the spreadability chart was incorporated into the system. A method to correct deflection data for temperature variations was adopted. The procedure considers the temperature history, surface temperature, pavement thickness, and the time of day of testing. A computerized pavement evaluation system was developed to aid maintenance personnel in making the most appropriate pavement rehabilitation decision. Priority listings are generated for maintenance relating to the pavement condition parameters; structural adequacy, distress, serviceability, and skid. An overall listing is also produced considering the failure modes with respect to average daily traffic, 18 Kip loads, running speeds and functional class.

PB-254 853/5GA PC$6.00/MF$3.00
Virginia Inst. of Marine Science, Gloucester Point.
An Assessment of Estuarine and Nearshore Marine Environments.
Final rept.,
M. P. Lynch, B. L. Laird, N. B. Theberge, and J. C. Jones. Mar 76, 150p* VIMS-SRAMSOE-93-Rev, FWS/OBS-76/05

Descriptors: *Estuaries, *Coasts, *Water management, *Environmental impacts, *Conservation, Water pollution, Biological surveys, Fisheries, Benthos, Marshes, Hydrology, Coastal topographic features, Government policies, Regulations, Recreation, Economic development, Ecology, Legislation, Assessments.
Identifiers: Water pollution effects(Animals).

The impact of water uses and projected water demands upon the estuarine and nearshore marine environments of the United States have been evaluated. It included a regional review of major estuarine and nearshore marine habitats, major problems impacting water and water resources, the management approach of the states, and Federal management initiatives, particularly Federal-State interactions. Estuarine resource harvest and projections are given for commercial fisheries, sport fishing, waterfowl, other wildlife harvest, bird watching, and recreational boating. Conflict areas include domestic versus foreign fleets, commercial versus sport fishing, subsistence versus commercial harvest activities. Future harvest and recreational projections include demand/supply of fisheries products, and recreation and hunting demands. Impacts of predicted water resource utilization include demand/supply, patterns of water use, seasonal and annual freshwater outflows, and effects of increased consumptive use.

PB-254 856/8GA MF$3.00
Alaska Univ., Anchorage. Arctic Environmental Information and Data Center.
Kodyak, a Background for Living,
Eugene H. Buck, William J. Wilson, Larry S. Lau, Caedmon Liburd, and Harold W. Searby. 1975, 337p NOAA-76033001
Grant NOAA-04-3-158-41

Descriptors: *Environmental surveys, *Natural resources, *Alaska, *Community development, *Kodiak Island, *Chirikof Island, Topographic features, Glacial features, Water resources, Wildlife, Aquatic animals, Vegetation, Climate, Earthquakes, Tsunamis, Volcanoes, Water transportation, Air transportation, Land use, Fisheries, Shellfish, Agriculture, Crude oil, Minerals, Recreation.
Identifiers: Sea Grant program.

The primary objectives of this study are to provide a better understanding of the environment of the Kodiak Island Group and adjacent waters, including Chirikof Island, and to explain the processes which determine resource occurrence and affect resource use for the people of the Kodiak Island Borough. The introductory chapter describes the geologic history and topography of the Kodiak Island Group. The body of information focuses on several environmental issues pertinent to the region. One area in particular deals with the environmental criteria to be evaluated in the development of dwellings and emphasizes structure placement, water availability, and weather conditions. A chapter devoted to navigation and safety at sea and in the air discusses regional environmental factors which govern safe passage for these forms of transportation. The largest section of the book deals with man's utilization of the resources of this area. A final chapter is devoted to the environmental quality of the islands. Color illustrations reproduced in black and white.

PB-254 881/6GA PC$4.50/MF$3.00
Richardson Associates, New York.
Northeast Corridor High Speed Rail Passenger Improvement Program. Materials and Equipment Demand/Supply Study.
Final rept.
Jun 76, 70p FRA/NECPO-76/06
Contract DOT-FR-56010

Descriptors: *Railroads, *Passenger transportation, Supplies, Materials, Equipment, Cost plus contracts, Procurement, Transformers, Circuit breakers, Railroad tracks, Railroad signals, Passenger terminals, Maintenance, Rail transportation, Transportation management.
Identifiers: High speed trains, Commuter rail systems, Northeast Region(United States).

The report presents the results of a demand/supply analysis of the major materials and equipment required by the Northeast Corridor rail passenger service improvement program. The purpose of the study is to identify those items (1) where design and specifications, and production lead-times may have a major impact on delivery and price, and (2) where development of long-term procurement arrangements with suppliers is essential to assure continuity of supplies during the 1976-82 time period because of the possible emergence of capacity bottlenecks. This study is also intended to assist in the development of alternatives to de facto cost plus pricing proposals by suppliers of materials and equipment, especially those involving long lead-times.

PB-254 960/8GA PC$7.50/MF$3.00
Water Resources Engineers, Inc., Springfield, Va.
Evaluation of Flood Risk Factors in the Design of Highway Stream Crossings. Volume III. Finite Element Model for Bridge Backwater Computation.
Final rept.,
M. T. Tseng. Apr 75, 184p WRE-20810, FHWA/RD-75-53
Contract DOT-FH-11-7689
See also Volume 1, PB-244 486.

Descriptors: *Highway bridges, *Flood plains, *Stream flow, Channels(Waterways), Open channel flow, Embankments, Flow distribution, Finite element analysis, Mathematical models, Computer programs.
Identifiers: *Backwater, *Flood risk, *Risk analysis.

A mathematical model describing the steady, two-dimensional subcritical flow in wide, heavily vegetated flood plains of bridge waterways has been developed using the finite element method of numerical analysis. The basic fluid equations comprising the model consist of the phenomenologic motion equations and the continuity equation, which are solved simultaneously by numerical methods to yield the spatial distribution of water surface elevations and velocities within the flow region for prescribing boundary conditions. The model simulates flow characteristics of arbitrary geometry. Hydraulic computations for various highway stream crossing orientations can be performed by the model. The model also simulates flow overtopping roadway embankments and performs hydraulic computations for a series of bridges across a stream valley without requiring prior assumption of the flow distribution for each bridge opening. The model has been tested for two example problems: a field site near Laurel, Mississippi, and for hydraulic flume data. In both examples good agreement between the model and the observed data was demonstrated.

PB-254 989/7GA PC$4.50/MF$3.00
Geological Survey, Raleigh, N.C. Water Resources Div.
Thermal Loading of Hyco Lake, North Carolina. The Effect of Heated Water on Temperature and Evaporation, 1966-74.
Water-resources investigation (Final),

G. L. Giese. May 78, 56p USGS/WRI-76/48, USGS/WRD/WRI-76/044
Prepared in cooperation with North Carolina Dept. of Natural and Economic Resources, Raleigh, and Carolina Power and Light Co., Raleigh, N.C.

Descriptors: *Thermal pollution, *Hyco Lake, Thermal stresses, Electric power plants, Temperature, Evaporation, Water loss, Surface temperature, Periodic variations, North Carolina.
Identifiers: *Water temperature.

Between May 1966 and December 1974, four phases of thermal loading from three steam-electric generators have resulted in higher temperatures and increased evaporation from Hyco Lake, a 4,350 acre (1,760 hectares) reservoir in north-central North Carolina. Average thermal loads during phases 1-4 were, respectively, 1.1, 2.6, 2.9, and 3.9 trillion British thermal units per month. Average monthly surface temperature increases during phases 1-4 were 2.4, 5.1, 5.0, and 5.8 degrees Fahrenheit. These values compare with an average annual natural lake surface temperature of 62.5 degrees Fahrenheit (16.9 degrees Celsius) and average annual natural evaporation of 37 inches (940 millimetres) or 18.4 cubic feet per second (521 litres per second).

PB-255 006/9GA PC$7.75/MF$3.00
Pennsylvania State Univ., University Park. Dept. of Mechanical Engineering.
Bituminous Pavement Polishing.
Final rept.,
S. H. Dahir, and W. E. Meyer. Nov 74, 215p ARP-S66
Report on Automotive Research Program. Prepared in cooperation with Federal Highway Administration, Washington, D.C.

Descriptors: *Flexible pavements, *Skid resistance, Surface properties, Polishing, Aggregates, Surface roughness.
Identifiers: *Skid numbers.

Eleven test strips containing replicate sections of bituminous pavements used in Pennsylvania were placed at the behest of a Joint Industry-PennDOT Task Force to investigate field performance of the aggregates. Fifty-two aggregate samples and 223 pavement cores of the test sections were polished in the laboratory by various methods. Laboratory-field data correlations indicate that the general level of skid resistance characteristics of surface aggregates may be determined in the laboratory and that aggregates are ranked similarly by both approaches. However, the correlations failed to produce regression equations that could, with confidence, define mathematical relationships for predicting specific field skid numbers.

PB-255 022/6GA PC$5.00/MF$3.00
Massachusetts Univ., Amherst. Water Resources Research Center.
Designing a River Basin Sampling System.
Completion rept.,
Thomas G. Sanders, Donald Dean Adrian, and Bernard B. Berger. Mar 76, 95p Pub-62, Completion-FY-76-9, W76-10131, , OWRT-A-041-MASS(4)
Contract DI-14-31-0001-4021

Descriptors: *Sampling, *Water analysis, Streams, Concentration(Composition), Rivers, Monitoring, Design criteria, Sites, Measurement equipment, Connecticut River Basin, Trace elements, Water quality, Mathematical models.
Identifiers: *Water pollution sampling, Baseline measurements.

The major objectives were: (1) To develop criteria to be used for specifying the number of sampling points in a river basin and their longitudinal, lateral and vertical location; (2) To develop criteria which would specify the frequency of sampling for baseline concentrations and year-to-year trends; The general location of sampling stations was specified by means of a stream numbering system. This location, termed the macrolocation, was then further refined by considerations of upstream discharges which might influence the longitudinal, lateral and vertical variation in pollutant concentrations. A representative sample of water quality in the stream's transect may require compositing samples withdrawn from various portions of the stream. A time series model was used to determine trends and to investigate the efficacy of various sampling frequencies.

PB-255 051/5GA PC$6.75/MF$3.00
Ohio River Valley Sanitation Commission, Cincinnati.
Thermal Discharges to the Ohio River. An Evaluation of River Temperature Relationships, 1964-1974.
Final rept.
Dec 75, 172p ORS-TR-001

Descriptors: *Thermal pollution, *Ohio River, Time series analysis, Temperature measurement, Electric power plants, Stream flow, Mixing, Aquatic animals, Fishes, Abundance, Water quality, Monitoring, Inventories, Tables(Data).
Identifiers: *Water temperature.

Thermal Discharges provides a macro-evaluation of overall thermal quality in the Ohio River, including aquatic life considerations. It contains a complete inventory of power generation facilities on the Ohio.

PB-255 064/8GA PC$4.50/MF$3.00
Federal Railroad Administration, Washington, D.C. Rail Passenger Programs Div.
Rail Passenger Statistics in the Northeast Corridor 1974-75,
Robert L. Winestone. Mar 76, 64p*

Descriptors: *Rail transportation, *Passenger transportation, Travel demand, Energy conservation, Gasoline, Statistical data, District of Columbia, Maryland, Virginia, New York, Massachusetts.
Identifiers: High speed trains, Commuter rail systems, Northeast Region(United States), Transit riders, Boston(Massachusetts), New York City(New York), Metroliner.

The monthly data for the years 1974 and 1975 reflect different aspects of train ridership on the Northeast Corridor. In 1974 patronage was substantially higher than it was in 1973 due to the fear that there would be no gasoline available when needed during an intercity automobile trip. In 1975 this fear had subsided, and although generally the number of passengers were higher than had been the case in 1973, the patronage figures were lower than the 1974 high.

PB-255 092/9GA PC$4.00/MF$3.00
City Coll., New York. Dept. of Chemistry.
Electrochemical Analysis of Sulfidic and Amine Odorants.
Final rept. 1 Jun 73-30 Nov 74,
Jerry N. Nwankwo, and Amos Turk. Jun 76, 46p EPA/600/2-76/021
Grant EPA-R-802396

Descriptors: *Electrolytic analysis, *Odors, *Amines, *Organic sulfides, *Gas analysis, Electrolytic cells, Oxidation reduction reactions, Air pollution, Concentration(Composition), Industrial wastes, Combustion products, Exhaust emissions, Measuring instruments.
Identifiers: *Air pollution detection, Voltammetry, Chronocoulometric analysis.

Oxidation of odorous vapors at the anode of an electrochemical cell was studied as a promising approach to achieving instrumental analysis of odors. The technique of linear potential sweep cyclic voltammetry was used to investigate the oxidizability of several amines, sulfides, and their mixtures on platinum, gold, glassy-carbon, carbon paste, and graphite electrodes. Results of the analyses of individual amines showed that the ease of oxidation on a platinum electrolyte was: tertiary > secondary > primary. Results for runs conducted on mixtures containing combinations of primary, secondary, and tertiary amines indicated that separate current peaks were not obtained for the various amines. Instead, a composite peak was obtained for any given mixture. Results for sulfides using a platinum electrode indicated that allyl sulfide, n-butyl sulfide and tert-butylsulfide could be oxidized in acetonitrile solution with 0.1 M $NaClO_4$ as supporting electrolyte. The order was: tert-butylsulfide > n-butylsulfide > allylsulfide. When amines and sulfides were mixed, a clear separation of the peaks was observed. The results indicate that it is possible to characterize a mixture of amines and sulfides by linear potential sweep cyclic voltammetry.

PB-255 095/2GA PC$4.50/MF$3.00
Southern Research Inst., Birmingham, Ala.
Evaluation of Rexnord Gravel Bed Filter.
Final rept. through 31 Jan 76,
Joseph D. McCain. Jun 76, 53p SORI-EAS-76-299, EPA/600/2-76/164
Contract EPA-68-02-1480

Descriptors: *Air pollution control, *Particles, Fines, Dust control, Industrial wastes, Flue gases, Filters, Design criteria, Impactors, Gravel, Pits(Excavation), Concentration(Composition), Portland cements, Industrial plants.
Identifiers: *Rexnord filter systems, *Cement plants.

The report gives results of fractional and overall mass efficiency tests of a full-scale Rexnord gravel bed filter system used to control particulate emissions from a Portland cement plant clinker cooler. Total flue gas particulate mass concentrations and emission rates were determined at the inlet and outlet of the gravel bed system by conventional (Method 5) techniques. Inlet and outlet emission rates as function of size were determined on a mass basis using cascade impactors for sizes from about 0.5 to 5 micrometers, and on a number basis for sizes smaller than about 1 micrometer using optical and diffusional methods. The report briefly describes the Portland cement process, the Rexnord gravel bed filter system, the measurement methods, inlet and outlet particle size distribution data, and fractional efficiencies.

PB-255 100/0GA PC$6.75/MF$3.00
Environmental Protection Agency, Seattle, Wash. Region X.
Oregon Water Supply Program Evaluation.
Final rept.
Jan 76, 168p EPA/910/9-76/019

Descriptors: *Potable water, *Water supply, State government, Public health, Monitoring, Evaluation, Standards, Water pollution, Statutes, Legislation, Water quality, Sources, Tables(Data), Oregon.

The report describes a program evaluation of the Oregon drinking water supply monitoring, technical assistance and enforcement programs. To accomplish these objectives, department files of 55 community water supplies were examined. These supplies were selected from different population groupings in various geographical areas throughout the state.

PB-255 103/4GA PC$4.50/MF$3.00
National Inst. of Scientific Research, Rancho Santa Fe, Calif.
Design of Pollutant-Oriented Integrated Monitoring Systems. A Test Case: Environmental Lead.
Interim rept.,
Dale W. Jenkins. Apr 76, 62p* EPA/600/4-76/018
Contract EPA-68-03-0443

Descriptors: *Lead(Metal), *Environmental surveys, *Air pollution, *Water pollution, Monitoring, Design criteria, Concentration(Composition), Mathematical models, Performance evaluation, Public health, Toxicity, Risk, Lead poisoning, Exposure.
Identifiers: *Environmental health, Pollutant identification, Air pollution effects(Humans).

It is necessary to assure that monitoring measurements are directly related to the population of highest risk and that the major sources of pollutants are clearly identified and quantified. An integrated monitoring system is a systems approach for providing the information necessary to permit efficient control of those sources of pollutants causing major threats to the population of highest risk. A 'Workship for the Design of a Pollutant-Oriented Integrated Monitoring System' convened by EPA in March 1974 summarized the elements of such a systems approach and discussed those information needs yet to be satisfied by basic monitoring research.

PB-255 124/0GA PC$4.50/MF$3.00
Environmental Protection Agency, Philadelphia, Pa. Surveillance and Analysis Div.
A Pre-Impoundment Water Quality Investigation for the Proposed Gathright Reservoir.
Jun 73, 54p

Descriptors: *Water pollution, *Jackson River, *Gathright Reservoir, Water quality, Temperature, Conductivity, Bacteria, Invertebrates, Inorganic phosphates, Sulfates, Iron, Turbidity, Virginia.
Identifiers: *Water quality data.

The Environmental Protection Agency, Region III, was requested by the U. S. Army Corps of Engineers (Norfolk, Va. District) to conduct a preimpoundment water quality study on the Jackson River for the proposed Gathright Reservoir Project. The report describes a water quality survey of the Jackson River above Covington, Virginia.

PB-255 126/5GA PC$4.00/MF$3.00
Environmental Protection Agency, Denver, Colo. Div. of Air and Water Programs.
Summary: Evaluation of the Wyoming Water Supply Program.
Dec 72, 32p

Descriptors: *Water quality, *Wyoming, *Potable water, Water supply, Water pollution, Evaluation, Acceptability, Chemical analysis, Aquatic microbiology, Fluoridation, Recommendations.
Identifiers: Campbell County(Wyoming), Lincoln County(Wyoming), Natrona County(Wyoming).

Three of Wyoming's twenty-three counties were selected for in-depth studies of the public, private, and semi-public water supplies. The three counties - Campbell, Lincoln, and Natrona - were selected to reflect differences in type of water supply and surveillance being used. Twenty-three public supplies were surveyed in the three counties. In addition, the communities of Laramie, Saratoga, Sinclair, Rawlins, Thermopolis, and Worland, which add fluorids to their water supplies were surveyed to determine the adequacy of the fluoridation program.

PB-255 132/3GA PC$4.00/MF$3.00
Environmental Protection Agency, Wheeling, W. Va. Surveillance and Analysis Div.
Water Quality Assessment for the Kanawha River Basin (North Carolina, Virginia, West Virginia),
Raymond C. George, and Robert I. Cantor. Sep 73, 34p Work Document-50, EPA/903/9-73-006

Descriptors: *Water quality, *Kanawha River Basin, Surface drainage, Water pollution, Sewage, Kanawha River, Bluestone River, Greenbrier River, Gauley River, Elk River, Little Coal River, Coal River, Pocatalico River, New River, Recreational facilities, Fishing, North Carolina, Virginia, West Virginia, Trends, Maps.

The purpose of this document is to provide answers to four questions: (1) what is the current water quality situation; (2) why does the situation exist; (3) what has been the trend in recent years; and (4) what will the water quality be in years to come. In so doing, identification is made of significant water bodies that, in 1973, met the 1983 goal of water quality adequate for swimming and for the protection and propagation of fish and wildlife and water bodies that might achieve the 1983 goal by 1977, 1983 or some later date.

PB-255 135/6GA PC$3.50/MF$3.00
Pacific Northwest Environmental Research Lab., Corvallis, Oreg. Coastal Pollution Branch.
Extramural Publications List,
Arleen M. Childears. 1974, 17p

Descriptors: *Water pollution, *Coasts, Scientific research.

Lists reports prepared covering various aspects of coastal pollution.

PB-255 136/4GA PC$3.50/MF$3.00
National Water Quality Lab., Duluth, Minn.
List of Publications of the National Water Quality Laboratory.
8 Jul 74, 12p

Descriptors: *Water pollution, Scientific research, Aquatic animals, Toxicology, Fishes, Oxygen demand, Contaminants, Shellfish, Insects, Survival, Water quality management.
Identifiers: Water pollution effects(Animals).

Lists reports covering water quality maintenance in natural waters and on water pollution effects on aquatic fauna.

PB-255 137/2GA PC$4.00/MF$3.00
Environmental Protection Agency, College, Alaska. Arctic Environmental Research Lab.
Alaska Village Demonstration Projects: First Generation of Integrated Utilities for Remote Communities.
Oct 73, 36p Working Paper-22

Descriptors: *Alaska, *Sanitary engineering, Rural areas, Waste water, Sewage disposal, Potable water, Sewage treatment, Regional planning.

The report describes the Alaska Village Demonstration Project which was authorized by Congress in 1970 to demonstrate methods of providing safe water supplies, toilets, bathing and laundry facilities, sewage disposal, and other similar facilities for remote Alaskan communities.

PB-255 140/6GA PC$6.75/MF$3.00
Environmental Protection Agency, Washington, D.C. Office of Solid Waste Management Programs.
Decision-Makers Guide in Solid Waste Management,
Robert A. Colonna, and Cynthia McLaren. 1974, 153p* EPA-SW-127

Descriptors: *Solid waste disposal, *Management planning, *Economic analysis, Government policies, National government, Regulations, Cost effectiveness, Environmental impacts, Air pollution, Water pollution, Esthetics, Fuels, Materials recovery, Land use, Legislation, Financing, Collection, Separation, Manpower, Transportation, Sanitary landfills, Tires, Lubricating oils, Paper, Plastics, Sludge disposal, Hazardous materials, Incentives, Baling, Shredding, Incinerators, State government, Local government.
Identifiers: *Waste recycling, Waste transfer stations, Tire recycling, Oil wastes.

This guide presents the key issues of solid waste management in a decision-making context. It attempts to anticipate all of the important decisions which local government managers must make in the effort to develop and operate solid waste programs in a responsive, cost-effective manner. Each chapter presents an issue, describes the alternatives, gives the advantages and disadvantages, and concludes with a summary statement which may include an EPA recommendation on the issue. Four basic categories of criteria by which decisions are mde in this field are the following: costs, environmental factors, resource conservation, and institutional factors.

PB-255 143/0GA PC$7.75/MF$3.00
Environmental Protection Agency, Denver, Colo. Div. of Air and Water Programs.
Evaluation of the Wyoming Water Supply Program.
Dec 72, 223p

Descriptors: *Water supply, *Water quality management, Wyoming, Potable water, Water pollution, Regulations, Government policies, Fluorides, Monitoring, Public health, Biochemical oxygen demand, Water analysis.
Identifiers: Campbell County(Wyoming), Lincoln County(Wyoming), Natrona County(Wyoming).

In-depth studies of the public, semi-public, and individual water supplies were conducted in Campbell, Lincoln, and Natrona Counties. These counties were selected because each had different types of water sources and surveillance. A total of 23 public, 13 semi-public, and 127 individual supplies were surveyed in the three counties. Bacteriological and chemical qualities of the supplies were judged on the basis of the 1962 U.S. Public Health Service Drinking Water Standards. In addition, the adequacy of the Water Supply Program was evaluated on the basis of surveillance activities, laboratory resources, policies, legislation, budget, and manpower.

PB-255 145/5GA PC$16.25/MF$3.00
Environmental Protection Agency, Washington, D.C. Water Quality Office.
Pollution of Lake Michigan and Its Tributary Basin, Illinois, Indiana, Michigan, and Wisconsin. Proceedings of Conference, Session (4th), Held at Chicago, Illinois, on September 19-21, 1972. Volume I.
21 Sep 72, 625p
See also PB-253 311.

Descriptors: *Water pollution, *Lake Michigan, *Meetings, Streams, River basins, Water treatment, Phosphorus inorganic compounds, Pesticides, Chlorides, Thermal pollution, Personnel, Objectives, Recommendations, Government policies, Regional planning, Wisconsin, Illinois, Indiana, Michigan, State government, National government, Surveys, Standards.
Identifiers: *Tributaries, Standards compliance.

The meeting was held to discuss the current problems faced by state and federal agencies charged with the duty of protecting Lake

Michigan from the deleterious effects of the various types of pollution.

PB-255 147/1GA PC$6.00/MF$3.00
Federal Water Quality Administration, Chicago, Ill. Great Lakes Region.
Report for the Subcommittee on Energy, Natural Resources and Environment of the Senate Commerce Committee Hearing on Mercury Contamination Under the Direction of Senator Phillip A. Hart, at Mount Clemens, Michigan, May 8, 1970.
1 May 70, 146p

Descriptors: *Mercury(Metal), *Water pollution, Great Lakes, Fishing grounds, Lake Saint Clair, Saint Clair River, Lake Erie, Lake Ontario, Detroit River, Surveys, Economic impact, Sediments, Sampling, Chemical analysis, Data.
Identifiers: *Great Lakes Region(United States), Water pollution effects(Human).

Partial Contents: Hazards of mercury in the environment with special reference to the aquatic habitat; Preliminary report on mercury survey in St. Clair River to Lake Erie system; Miscellaneous mercury analyses in Lake Erie Basin; Economic impact of the current mercury pollution problems in Lakes St. Clair and Erie; Inventory of industries using mercury; Federal-State water quality standards and USPHS drinking water standards for mercury and heavy metals; Water quality standards, Federal enforcement procedures and the 1899 Rivers and Harbors Act; The respective roles of the States and Federal Government in the enforcement of water quality standards.

PB-255 151/3GA PC$11.00/MF$3.00
Environmental Protection Agency, Athens, Ga. Southeast Water Lab.
Report of Waste Source Inventory and Evaluation, Dade County, Florida. Technical Appendix I. Major Municipal Wastewater Treatment Facilities.
Jun 71, 408p
See also PB-255 152.

Descriptors: *Sewage treatment, *Industrial wastes, *Water quality, Florida, Government policies, Regulations, Water analysis, Sources, Biochemical oxygen demand, Suspended solids, Tables(Data).
Identifiers: Water quality data, Water pollution sampling, Dade County(Florida).

Seventy-six wastewater treatment plants were surveyed between November 28, 1970 and February 2, 1971. Analyses were performed to determine treatment efficiency, adequacy of bacterial disinfection and effluent loading. Technical Appendices I and II are the engineering and laboratory evaluations of each plant. An industrial waste inventory located and identified the significant industrial waste sources.

PB-255 152/1GA PC$10.50/MF$3.00
Environmental Protection Agency, Athens, Ga. Southeast Water Lab.
Report of Waste Source Inventory and Evaluation, Dade County, Florida. Technical Appendix II. Minor Municipal Wastewater Treatment Facilities.
Jun 71, 354p
See also PB-255 151.

Descriptors: *Sewage treatment, *Water quality, Florida, Biochemical oxygen demand, Suspended solids, Chlorination, Sewage filtration, Tables(Data).
Identifiers: *Water quality data, Water pollution sampling, Dade County(Florida).

This Technical Appendix contains field and laboratory data and engineering evaluation reports for each of forty-seven minor domestic wastewater treatment plants in Dade County, Florida, which were visited during the period of December 1970 through February 1971. No attempt has been made to retabulate or 'dress-up' the original work sheets and data forms.

PB-255 155/4GA PC$3.50/MF$3.00
National Environmental Research Center, Edison, N.J. Edison Water Quality Research Div.
Storm and Combined Sewer Pollution Control Program Reports. Research, Development, and Demonstration Grant, Contract, and In-House Project Reports.
Jan 72, 10p

Descriptors: *Water pollution abatement, *Combined sewers, *Storm sewers, Research projects, Standards, Regulations, Management, Grants, Design.

These reports are called the Water Pollution Control Research Series and describe the results and progress in the control and abatement of pollution in our Nation's waters. They provide a central source of information on the research, development, and demonstration activities in the water research program of the Environmental Protection Agency, through in-house research and grants and contracts with Federal, State, and local agencies, research institutions, and industrial organizations.

PB-255 157/0GA PC$6.00/MF$3.00
National Field Investigations Center-Cincinnati, Ohio.
Water Quality of the Ohio River, Louisville, Ky. - Evansville, Ind.,
Richard K. Ballentine, and Nelson A. Thomas.
Sep 70, 143p

Descriptors: *Water quality, *Ohio River, Water pollution, Aquatic microbiology, Coliform bacteria, Sewage, Oxygen, Dissolved gases, Fishes, Surveys, Kentucky, Indiana.
Identifiers: Louisville(Kentucky), Evansville(Indiana), Dissolved oxygen.

During October 1967 a water quality survey was made on the Ohio River between Louisville, Kentucky and Evansville, Indiana, to determine bacteriological quality including the causes of high coliform densities, and the probable causes of reported fish flesh tainting. The study of the off-flavor of fish was extended to January 1969 to gain additional information about specific waste sources.

PB-255 158/8GA PC$3.50/MF$3.00
Robert A. Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
Nutrient Removal from Waste Water, 1970 Status.
1970, 14p

Descriptors: *Sewage treatment, *Nitrogen, Ammonia, Nitrification, Activated sludge process, Chemical removal(Sewage treatment), Water pollution control.
Identifiers: Ammonia stripping, Denitrification.

This report discusses nitrogen removal from sewage effluent. Ammonia nitrogen deleterious effects and removal is also described.

PB-255 161/2GA PC$5.50/MF$3.00
Environmental Protection Agency, Athens, Ga. Southeast Water Lab.
Report of Waste Source Inventory and Evaluation, Dade County, Florida.
Jun 71, 119p

Descriptors: *Water quality, Water pollution, Waste waters, Industrial wastes, Sewage, Nitrogen, Phosphorus, Chlorine, Solids, Carbon, Biochemical oxygen demand, Coliforms, Temperature, Surveys, Sources, Regulations, Recommendations, Florida.
Identifiers: Dade County(Florida).

Results of a survey of industrial and major and minor municipal waste sources are given. Recommendations concerning improvement of waste treatment facilities and water quality are presented.

PB-255 162/0GA PC$3.50/MF$3.00
Environmental Protection Agency, Athens, Ga. Surveillance and Analysis Div.
Water Quality Comparison Study, Escambia River and Other Northwest Florida Streams.
Jan 72, 14p

Descriptors: *Water quality, *Escambia River, Water pollution, Biochemical oxygen demand, Nitrogen, Phosphorus, Color, Carbon, Turbidity, Coliforms, Solids, Temperature, Dissolved gases, Surveys, Florida.
Identifiers: Northwest Region(Florida), Dissolved oxygen.

A limited survey was conducted to produce data for use in comparing water quality (including nutrient quality) of the Escambia River with other streams in the Northwest Florida area. Of particular interest were the relative nitrogen, phosphorus and organic concentrations.

PB-255 164/6GA PC$4.50/MF$3.00
Environmental Protection Agency, Washington, D.C.
Toward Clean Clear Water. 1972 Catalog.
Technology transfer rept.
1972, 75p

Descriptors: *Water pollution abatement, *Organizations, *Regions, Laboratories, Research, Monitoring, Environmental impacts, Technology, Projects, Facilities, Federal assistance programs, Technology transfer, Legislation.
Identifiers: *Environmental Protection Agency, River and Harbor Act of 1899.

This catalog has been prepared to demonstrate how EPA had aided in this cause in the past, and, more importantly, how EPA can help now in achieving the universal goal of a clean environment with regard to wastewater. Information is presented on every program in EPA which is concerned with wastewater, whether it be control, treatment, monitoring, or the establishment of standards. Key individuals and organization charts for each program are included; availability of documents and/or information is indicated and sources are listed; Important current projects of each program are described. Color illustrations reproduced in black and white.

PB-255 163/6GA PC$4.00/MF$3.00
Massachusetts Univ., Amherst. Water Resources Research Center.
Strengthening Lake-Shoreland Management in Massachusetts,
Bernard B. Berger, Jon Kusler, and Sally Klinginer. Feb 76, 27p Pub-68, Completion-FY-76-14, W76-10264, , OWRT-A-075-MASS(1)

Descriptors: *Lakes, *Shores, *Land development, *Meetings, Management, Research projects, Legislation, Renovating, Universities, State government, Data processing, Local government, Regional planning, Massachusetts.

A seminar was conducted in a series of eight sessions during the spring of 1975. Its major objectives were the following: Identify lake problems and possible components of a conjunctive university, state, regional and local program to prevent problems or provide timely

control of problems; provide a basis for an effective, continuing exchange of information between university groups and public agencies on lake-related problems and research programs; help formulate research priorities and mechanisms for joint university-public agency research undertakings; provide a proposal for legislation or other public action designated to protect Massachusetts lakes. The report provides a set of general as well as specific recommendations for strengthening lake-shoreland management in Mass.; also included is a Draft Lake-Shoreland Regulation Bill.

PB-255 217/2GA PC$12.00/MF$3.00
Clean Water Consultants, El Dorado, Calif.
Technical Guidelines for Public Water Systems.
Final rept.,
Russell L. Culp. 16 Jun 76, 474p* 46
Contract EPA-68-01-2971

Descriptors: *Public works, *Water treatment, *Water supply, *Water pollution, *Handbooks, Natural waters, Sites, Bibliographies, Design criteria, Industrial waste treatment, Water quality, Fluoridation, Chemical removal(Water treatment), Inorganic chemicals, Organic chemicals, Pesticides, Trace elements, Metals, Radioactive isotopes, Chemical removal(Sewage treatment), Sludge disposal, Filtration, Taste, Chlorination, Ozonation, Ultraviolet radiation, Water softening, Lime-soda ash process, Ion exchanging, Brines, Disinfection, Feedwater treatment, Odors, Activated carbon, Desalting, Solid waste disposal, Operations, Materials handling, Well pumps, Water storage, Pumping, Water distribution, Maintenance, Budgeting, Financial management, Safety, Sampling, Monitoring, Personnel, Standards.

This report presents technical guidelines for the design, operation, maintenance, staffing, and surveillance of public water systems including references and bibliography. Topics discussed include: general design considerations, source development, treatment, chemical application, pumping facilities, storage, distribution systems, operation and maintenance, surveillance, and personnel.

PB-255 224/8GA PC$4.00/MF$3.00
Geological Survey, Indianapolis, Ind. Water Resources Div.
Availability of Ground Water near Carmel, Hamilton and Marion Counties, Indiana.
Final rept.,
D. C. Gillies. May 76, 34p USGS/WRD/WRI-76/040, USGS/WRI-76-46
Prepared in cooperation with Indiana State Dept. of Natural Resources, Indianapolis. Div. of Water.

Descriptors: *Ground water, *Observation wells, *Water supply, Aquifers, Glacial deposits, Water table, Hydrology, Seepage, Pumping, Groundwater recharge, Availability, Drawdown, Water removal, Indiana.
Identifiers: *Aquifer characteristics, *Groundwater movement, Carmel(Indiana), Hamilton County(Indiana), Marion County(Indiana).

Flow in the unconsolidated glacial deposits near the city of Carmel in central Indiana was simulated by a digital-computer model in a study of hydraulic characteristics of the deposits. The study shows that 21.3 million gallons per day (933 litres per second) of additional water could be withdrawn from the aquifer for an indefinite period of time. This pumpage is approximately 5 million gallons per day (219 litres per second) above the projected water needs of Carmel for 1990. Saturated thickness, transmissivity, and storage coefficient of the outwash aquifer along the White River east of Carmel were determined, using available data supplemented by test drilling. The saturated thickness of the aquifer ranges from 10 to 110 feet (3 to 34 metres); transmissivity ranges from 1,000 feet squared per day (93 metres squared per day) to 24,000 feet squared per day (2,230 metres squared per day); and the average storage coefficient is 0.11.

PB-255 225/5GA PC$5.00/MF$3.00
Geological Survey, Menlo Park, Calif. Water Resources Div.
Sediment Discharge from Highway Cut-Slopes in the Lake Tahoe Basin, California, 1972-74.
Water-resources investigations (Final),
Carl G. Kroll. May 76, 91p USGS/WRI-76-19, USGS/WRD/WRI-76/042
Prepared in cooperation with California State Div. of Highways, Sacramento.

Descriptors: *Soil erosion, *Sediment transport, *Highways, *Lake Tahoe Basin, Stream flow, Runoff, Slopes, Drainage, Erosion control, Performance evaluation, Measurement, Estimating, California, Tables(Data), Water quality.

Streamflow and fluvial-sediment discharge data were collected at selected streams and highway gutters in the Lake Tahoe basin to determine the extent of erosion from highway cuts and to attempt to evaluate the effects of various land-treatment practices to reduce erosion. Estimate of long-term annual sediment discharge from six streams into the lake is 7,100 tons, of which 2,300 tons is finer than 62 micrometres. During 1972-74, snowmelt runoff (April-July) accounted for 65 percent of the water and sediment discharge. Approximately 90 percent of the sediment is transported in suspension. Sediment measured at 16 gutter-flow stations at the base of highway cut-slopes indicates that less than 100 tons of fine sediment per year are contributed to the lake from all California State highway cuts.

PB-255 246/1GA PC$6.75/MF$3.00
Environmental Protection Agency, Denver, Colo. Region VIII.
South Platte River Basin Accomplishment Plan.
4 Dec 72, 174p

Descriptors: *Water quality, *South Platte River Basin, *Colorado, *Nebraska, Water pollution abatement, Standards, Industrial wastes, Regulations, Government policies, Sewage treatment, Biochemical oxygen demand.
Identifiers: Water quality data, Baseline measurements.

This report contains area maps and water quality baseline data for the South Platte River Basin. The Basin covers 350 main stem stream miles plus 469 tributary stream miles to the Colorado/Nebraska border.

PB-255 247/9GA PC$5.00/MF$3.00
Environmental Protection Agency, Denver, Colo. Region VIII.
Accomplishment Plan. Region VIII. Cheyenne River Basin.
4 Dec 72, 97p

Descriptors: *Water quality, *Cheyenne River Basin, Water pollution, Waste waters, Sewage, Industrial wastes, Biochemical oxygen demand, Coliforms, Aquatic microbiology, South Dakota, Wyoming, Nebraska, Cheyenne River, Belle Fourche River, Whitewood Creek, Rapid Creek.

The number of river and shoreline miles covered by the basin accomplishment plan are roughly estimated and include the more important river systems with pollution problems. The plan focuses on those portions of the Cheyenne River from the western South Dakota border to its confluence with the Missouri River on the eastern border along with tributaries having major point source pollution problems.

PB-255 248/7GA PC$6.00/MF$3.00
Environmental Protection Agency, Denver, Colo. Region VII.
Red River of the North Basin.
4 Dec 72, 136p

Descriptors: *Water quality, *Red River of the North Basin, Water pollution, Waste waters, Sewage, Industrial wastes, Red River Basin, North Dakota, Regional planning.

The area of primary effort for Region VIII in this Accomplishment Plan falls entirely within the State of North Dakota. Plans to reduce water pollution from industrial and municipal wastes are covered.

PB-255 249/5GA PC$5.50/MF$3.00
Environmental Protection Agency, Denver, Colo. Region VIII.
Accomplishment Plan - Water Quality. South Platte River Basin.
Jun 72, 122p

Descriptors: *Water quality, South Platte River Basin, Water pollution, Waste water, Sewage, Aquatic microbiology, Oxygen, Colorado, Regional planning.
Identifiers: Dissolved oxygen.

The South Platte River Basin has been selected as one of Region VIII's highest priority areas for an abatement and control program. The basin encompasses the largest metropolitan area in the Region (Denver) as well as major portions of the urbanizing Front Range in Colorado. A program is defined to achieve by 1976 existing dissolved oxygen and bacteria standards and to upgrade the quality of specific reaches of the basin.

PB-255 250/3GA PC$4.00/MF$3.00
Environmental Protection Agency, Denver, Colo. Region VIII.
Plan Metro Denver. Environmental Protection Agency Workshop on Traffic Control Strategies.
Final rept.
1973, 33p

Descriptors: *Air pollution abatement, *Exhaust emissions, *Meetings, Automobiles, Colorado, Municipalities, Traffic control, Environmental impacts, Legislation, Buses(Vehicles), Parking facilities, Inspection, Policies, National government, Businesses, Citizen participation.
Identifiers: Motor vehicle inspection, Motor vehicle maintenance, Restrictions, *Denver(Colorado).

PLAN Metro Denver, an urban environmental citizens' action organization, received a contract from the U.S. Environmental Protection Agency to organize a workshop on transportation control strategies. The Workshop was held November 15, 1973 in Denver. This document is the final report of the Workshop, dealing with air pollution standards for automobiles related pollutants by 1977. Plans to maintain standards by regulating indirect sources of air pollution.

PB-255 253/7GA PC$4.00/MF$3.00
Environmental Protection Agency, Denver, Colo. Region VIII.
Report on Ultra-Hazardous Substances at Federal Installations in Colorado.
18 Apr 72, 34p

Descriptors: *Hazardous materials, *Military facilities, *National government, *Inventories, *Colorado, Military chemical agents, Biological agents, Radioactive materials, Explosives, Air

pollution abatement, Water pollution abatement, Solid waste disposal, Risks, Government policies, Regulations, Pesticides, Materials handling.
Identifiers: Contingency planning.

The findings of this report are based totally upon the information which was submitted in good faith by the various Federal offices. The Environmental Protection Agency made no attempt to verify or corroborate the information submitted. The hazardous substances reported fell into three categories: chemical and biological warfare agents, radioactive materials, and conventional explosive weapons and the chemicals involved in preparing them. The Federal installations reporting ultra-hazardous substances presented in this report are the following: Rocky Mountain Arsenal; AEC Rocky Flats Plant; Pueblo Army Depot; Fort Carson; AEC Grand Junction Compound; and Buckley Air National Guard Base. A complete assessment of the risks involved to the general population must await a further evaluation of current procedures for storing, handling, using and ultimately disposing of these substances. The degree of risk can best be formulated in terms of a 'maximum probable occurrence,' since leakage, explosions, fires, or other disasters involving these substances would most likely affect only a portion of the total amount of the substance listed, and under abnormal circumstances that do not occur with much frequency. The question that has to be answered through some open public decision-making process, is whether that risk is worth taking, particularly when these substances are located in densely populated urban areas.

PB-255 254/5GA PC$4.00/MF$3.00
Environmental Protection Agency, Denver, Colo. Region VIII.
Accomplishment Plan. Region VIII. Cheyenne River Basin Area.
Mar 72, 26p

Descriptors: *Water quality, *Cheyenne River Basin, Water pollution, Mine waters, Waste water, Agricultural wastes, Water wells, Radioactivity, Industrial wastes, South Dakota, Regional planning, Lake Oahe.

Significant pollution problems are found in the Cheyenne River Area. Municipal and industrial discharges threaten continued use of Lake Oahe and other rivers in the Cheyenne River Basin as major sources of water supply and for water-related agricultural and recreation activities in the area. This Accomplishment Plan addresses the needs of the Cheyenne River Basin Area.

PB-255 259/4GA PC$4.00/MF$3.00
Environmental Protection Agency, Denver, Colo. Technical Support Branch.
Summary of a Water Quality Survey, Greeley, Colorado. November 16-19, 1971.
Jul 71, 30p SA/TSB-1

Descriptors: *Water quality, *Colorado, Cache La Poudre River, Industrial plants, Waste water, Sewage, Oxygen, Aquatic microbiology, Surveys.
Identifiers: Greeley(Colorado), Great Western Sugar Plant, Sewage treatment effluent, Dissolved oxygen, Water quality data.

A water quality survey was conducted on the Cache La Poudre River and on selected waste discharges in the Greeley, Colorado, area during the period from November 16 to November 18, 1971. The purpose of the survey was to assess the effect of Great Western's sugar factory on the Cache La Poudre River and to determine the characteristics of the waste discharged from this plant. Because of the close proximity of Great Western's factory to the Greeley wastewater treatment facility, and because of other possible sources of wastes (i.e., feedlots) in the area, the water quality survey included the entire Greeley area.

PB-255 265/1GA PC$4.00/MF$3.00
Environmental Protection Agency, Denver, Colo. Region VIII.
Accomplishment Plan. Region VIII. Jordan River Basin - Salt Lake City Area.
Mar 72, 44p

Descriptors: *Water quality, *Jordan River Basin, Water pollution, Waste water, Sewage, Industrial wastes, Utah, Regional planning.

The Rocky Mountain - Prairie Region of the U.S. Environmental Protection Agency has prepared this plan for review and comments by State and local governments of the State of Utah and other interested organizations to promote a comprehensive integrated effort in addressing the environmental problems of the Jordan River Basin - Salt Lake City Area.

PB-255 269/3GA PC$7.75/MF$3.00
Montana Univ., Missoula. Dept. of Geology.
The Determination, Assessment, and Design of 'In-Stream Value' Studies for the Northern Great Plains Region.
Final rept.,
Ken D. Bovee. 1 Sep 74, 215p
Contract EPA-68-01-2413

Descriptors: *Water pollution, *Stream flow, *Fisheries, Hydrology, Fishes, Primary biological productivity, Water quality, Oxygen, Dissolved gases, Nutrients, Animal migrations, Temperature, United States, Reviews.
Identifiers: *Water quality data, *Northern Great Plains Region(United States), Polyodon spathula, Stizostedion canadense, Indicator species, Notorus flavus, Dissolved oxygen.

An extensive literature review was conducted to determine the discharge requirements of various components of a warm water fishery. Where exact hydrologic parameters were not measured directly in individual studies, they were estimated from inferred statements. A methodology is proposed for the recommendation of minimum discharges for a warm water fishery. This method utilizes field measurements of critical stream areas and biological criteria determined from the use of indicator species. For large rivers, migration and spawning requirements are analyzed using the paddlefish (Polyodon spathula) as the indicator species. For smaller rivers, the suggested indicator species is the sauger (Stizostedion canadense). Rearing flows are determined on the basis of stream productivity by analyzing macroinvertebrate habitats, and on the basis of fish habitat typing. The indicator species for determining adequate fish habitat is the stonecat (Notorus flavus).

PB-255 270/1GA PC$4.50/MF$3.00
Environmental Protection Agency, Denver, Colo. Region VIII.
Evaluation of the Impact of the Mines Development, Inc. Mill on Water Quality Conditions in the Cheyenne River.
Sep 71, 51p

Descriptors: *Water quality, *Cheyenne River, *Cottonwood Creek, Water pollution, Radioactive wastes, Chemical analysis, Uranium, Vanadium, Molybdenum, Reservoirs, Sediments, Industrial waste treatment, Tables(Data), South Dakota.
Identifiers: Mines Development Incorporated, Angostura reservoir.

An intensive water quality study of the Cheyenne River and the tributary stream, Cottonwood Creek, in the environs of the Mines Development Mill located at Edgemont, South Dakota, was conducted. The objectives of the study were to determine and evaluate: (1) Water quality conditions in Cottonwood Creek and the Cheyenne River during a period of dry weather flow; (2) Chemical and radioactivity loadings (mass/day) on Cottonwood Creek and the Cheyenne River as the result of seepage from mill ponds; (3) Radioactivity levels in the water, biota and bottom sediment of Angostura Reservoir.

PB-255 273/5GA PC$11.75/MF$3.00
Colorado State Univ., Fort Collins. Cooperative Extension Service.
An Analysis of Non-Point Source Pollution in the Rocky Mountain-Prairie Region. Preliminary Draft. Part I.
Joseph T. Newlin, and Robert C. Ward. Jan 74, 433p

Descriptors: *Water pollution, Sources, Surveys, States(United States), Irrigation, Drainage, Watersheds, Management, Rural areas, Septic tanks, Livestock, Waste disposal, Agricultural wastes, Forestry, Pesticides, Sludge disposal, Sewage disposal, Technology transfer, Recommendations, Surface waters, Ground water, Technology, Colorado, Utah, Wyoming, Montana, North Dakota, South Dakota.
Identifiers: *Rocky Mountain Region(United States), *Prairie Region(United States), Logging, Nonpoint sources.

The purpose of this report is to provide a description of the identified non-point sources of pollution within the six-state area of Colorado, Utah, Wyoming, Montana, North Dakota, and South Dakota which comprises Region VIII under the jurisdiction of the Environmental Protection Agency's Denver office. The areas of concern which have been investigated and reported upon include: irrigation return flows, range and watershed management, logging and forestry, rural-domestic wastes, livestock and waste disposal, pesticides and fertilizers, land disposal, and surface and groundwater problems.

PB-255 275/0GA PC$4.50/MF$3.00
Environmental Protection Agency, San Francisco, Calif. Water Quality Office.
Water Quality Conditions in Grand Lake, Shadow Mountain Lake, Lake Granby.
Dec 70, 65p

Descriptors: *Water quality, *Grand Lake, *Shadow Mountain Lake, *Lake Granby, Water pollution, Sewage, Waste waters, Algae, Nitrogen, Ammonia, Phosphorus, Plankton blooms, Temperature, Dissolved gases, Standards, Surveys, Colorado.
Identifiers: Dissolved oxygen.

The primary objective of this survey was to develop the water pollution control measures necessary to protect and preserve the recreational and other uses of these lakes. The report discusses physical, chemical, and biological conditions in the lakes and tributaries; nutrient inputs to the lakes from natural runoff; wastewater inflows to the lakes and their nutrient loads; and actions necessary to abate the present pollution and protect the lakes from accelerated eutrophication.

PB-255 278/8GA PC$10.50/MF$3.00
Automotive Testing Labs., Inc., Aurora, Colo.
Vehicle Testing to Determine Feasibility of Emission Inspection at Altitude,
Douglas R. Liljedahl, and Harold E. Porter. Sep 72, 361p
Contract EPA-68-01-0439

Descriptors: *Motor vehicles, *Exhaust emissions, *Air pollution abatement, Altitude, Technology transfer, Measurement, Elevation,

Reduction, Statistical data, Hydrocarbons, Nitrogen oxides, Carbon monoxide, Cost analysis, Correlations, Tests, Inspection, Feasibility, Automobiles, Colorado, Comparison, Factor analysis.
Identifiers: High altitude areas, Engine idle data, Motor vehicle inspection, Motor vehicle maintenance.

A laboratory study was conducted on 1968-1972 model vehicles at altitude to evaluate vehicle emission reduction concepts investigated and applied at lower elevations. Since vehicle exhaust hydrocarbons and carbon monoxide emissions are intrinsically high at higher elevations, it was suspected that emission reducing strategies might not prove significantly beneficial at higher elevations. Furthermore, emission reduction factors by engine maintenance are not defined. The study quantitatively defined hydrocarbon, nitrogen oxides, and carbon monoxide emission reduction. Direct maintenance cost was determined. Key mode and idle emission inspection concepts are discussed.

PB-255 279/2GA PC$6.00/MF$3.00
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
Cooperative Salinity Control Reconnaissance Study, Upper Colorado River Basin.
Final Review draft.
Feb 70, 128p
Prepared in cooperation with Bureau of Reclamation, Salt Lake City, Utah. Region 4.

Descriptors: *Water pollution, *Salinity, *Colorado River Basin, Sources, Irrigation, Mine waters, Industries, Concentration(Composition), Water consumption, Municipalities, Runoff, Water conservation, Water supply, Evaporation, Water pollution control, Research projects, Legislation, Cost analysis.

Contents:
Causes of salinity;
Effects of salinity on uses of water;
Technical possibilities for salinity control;
Status of salinity control activities in the upper Colorado basin;
Legal, institutional, and financial considerations.

PB-255 281/8GA PC$5.00/MF$3.00
Environmental Protection Agency, Denver, Colo. Region VIII.
Accomplishment Plan, Region VIII, Utah Lake-Jordan River Basin.
4 Dec 72, 97p

Descriptors: *Water quality, *Jordan River Basin, *Utah Lake, Water pollution, Sewage, Waste waters, Provo River, Industrial wastes, Utah, Regional planning.

This report discusses the Utah Lake - Jordan River Accomplishment Plan for Water Quality which encompasses the headwaters to the Great Salt Lake including all of Salt Lake and Utah Counties. The plan covers 940 stream miles and 150 square miles of surface water (Utah Lake).

PB-255 283/4GA PC$3.50/MF$3.00
Environmental Protection Agency, Denver, Colo. Region VIII.
Accomplishment Plan, Region VIII, Red River of the North Basin.
Mar 72, 23p

Descriptors: *Water quality, *Red River of the North, *Project planning, Water pollution, Dissolved gases, Oxygen, Coliform bacteria, Industrial wastes, Sewage, Minnesota, North Dakota.
Identifiers: Dissolved oxygen.

The Red River of the North Basin has been selected by Region VIII as a high priority area for a pollution prevention abatement and control program for Fiscal Years 1972, 1973 and 1974. Municipal, industrial and agricultural discharges have limited the use of the Red River of the North and some tributaries for water-related recreation activities. This accomplishment plan discusses the specific tasks and plans for accomplishing the water quality objectives of Region VIII for this area.

PB-255 284/2GA PC$4.50/MF$3.00
Environmental Protection Agency, Denver, Colo. Region VIII.
Accomplishment Plan, South Platte River Basin - Denver Area.
Jan 72, 56p

Descriptors: *Water quality, *South Platte River Basin, Regional planning, Water pollution abatement, Waste water, Sewage, Industrial wastes, Colorado.

A strategy to obtain recreation use classification upstream from Denver and a public water supply classification for the entire main stem is discussed.

PB-255 285/9GA PC$3.50/MF$3.00
Environmental Protection Agency, Denver, Colo. Region VIII.
Accomplishment Plan, Region VIII. Environmental Impact Statement Review,
John A. Green, and David D. Emery. 5 Jun 72, 18p

Descriptors: *Environmental impact statements, *Reviewing, *Management planning, Guidelines, State government, Local government, Evaluation, Quality control, Objectives, Methodology, Government policies, National government.
Identifiers: *Western Region(United States).

Recognizing that the review of environmental impact statements is an important mechanism for preventing environmental degradation in Region VIII, the regional office will review 115 environmental impact statements prepared by other Federal agencies in an average review time of 35 days and take appropriate followup measures to insure that the regional comments are adequately considered by other Federal agencies in their decision-making processes. The regional office will also provide assistance to other Federal agencies engaged in the EIS process. Procedures and coverage are discussed.

PB-255 297/4GA PC$5.50/MF$3.00
Southern Research Inst., Birmingham, Ala.
Particulate Collection Efficiency Measurements on an Electrostatic Precipitator Installed on a Paper Mill Recovery Boiler,
John P. Gooch, G. H. Marchant, Jr., and Larry G. Felix. May 76, 122p SORI-EAS-76-091, EPA/600/2-76/141
Contract EPA-68-02-2114
See also report dated Mar 75, PB-244 173.

Descriptors: *Air pollution control equipment, *Electrostatic precipitators, *Paper mills, Flue dust, Sulfate pulping, Boilers, Paper industry, Impactors, Particles, Performance evaluation, Performance tests, Particle size distribution, Sources, Measurement, Mathematical models.
Identifiers: Particulates, Stationary sources.

The report gives results of fractional and overall collection efficiency measurements of an electrostatic precipitator collecting 'salt cake' from a Kraft recovery boiler. Mass median diameter of the particulate entering the collector was approximately 1.0 micrometers; minimum average collection efficiency in the 0.1-2.0 micrometer diameter range was 99.92%. Size distributions at the precipitator inlet and outlet were measured with cascade impactors and an electrical aerosol analyzer. Overall mass efficiency measurements, based on a mass train with an in-stack filter, ranged from 99.92 to 99.96%. Fair agreement was obtained between the total mass loadings obtained with the mass trains and the impactors.

PB-255 299/0GA PC$10.00/MF$3.00
IIT Research Inst., Chicago, Ill.
Structural Analysis and Retrofitting of Existing Highway Bridges Subjected to Strong Motion Seismic Loading.
Final rept.,
R. R. Robinson, E. Privitzer, A. Longinow, and K. H. Chu. 14 May 75, 330p IITRI-J6320-FR, FHWA/RD-75-94
Contract DOT-FH-11-8136

Descriptors: *Earthquake resistant structures, *Bridges, Earth movements, Seismic waves, Loads(Forces), Dynamic structural analysis, Structural analysis, Cost effectiveness, California.
Identifiers: *Earthquake engineering, Seismic loads, Seismic risk, Risk analysis, *Retrofitting, *Soil structure interactions, Ground motion.

The objective of this project was to determine cost effective means for modifying existing intermediate size bridges so as to better withstand the damaging effects of intense earthquake ground motions. Research studies were performed to identify and define, through structural analysis, practical techniques and criteria for retrofitting the bridges selected during the program. The need for retrofitting is based on the philosophy that damage should be limited so that collapse does not occur and traffic can be restored after minimum repairs. Seven different bridge structures were selected throughout the United States in high risk seismic regions. Seismic loads were determined for each bridge based on the soil conditions and seismicity at its site. A simplified analysis procedure was defined during the project and validated by selective comparisons with nonlinear response analyses. Each bridge was analyzed for horizontal seismic loads. Failures and potential weaknesses are indicated for several of the structures and retrofit measures are recommended. All known retrofit concepts which are of potential value in reducing seismic bridge damage are described and illustrated. Based on this study, many bridges located in high seismic risk zones may be subjected to severe damage and potential failure during the life of the structure.

PB-255 327/9GA PC$4.50/MF$3.00
Louisiana State Univ., Baton Rouge. Center for Wetlands Resources.
Overland Flow in the Louisiana Coastal Zone; The Potential for Land Treatment of Waste Water on Diked Dredge Spoil Disposal Sites in South Louisiana,
Mark Meo, John W. Day, Jr., and Theodore B. Ford. Nov 75, 59p LSUSG-T-75-04, NOAA-76042002
Sponsored in part by Louisiana Water Resources Research Inst., Baton Rouge.

Descriptors: *Sewage treatment, *Industrial waste treatment, *Food processing, *Land use, Waste water, Vegetation, Dredging, Fisheries, Water quality, Removal, Carbon, Nitrogen, Phosphorus, Louisiana, Coasts.
Identifiers: Sea Grant program, *Sewage irrigation, *Overland flow.

The report discusses the attractiveness of land treatment of organic waste water through overland flow as an effective and economical means of dealing with increased waste loads and achieving federally mandated water quality criteria. A pilot project carried out in an enclosed marsh area in Dulac, Louisiana, and

using effluent from a menhaden processing plant indicated that overland flow is a valuable means for providing secondary and, in some cases, tertiary treatment of high-load organic waste water. In the experimental design primary-treated organic waste was sprayed at a low rate on a naturally vegetated slope.

PB-255 328/7GA PC$5.00/MF$3.00
Louisiana State Univ., Baton Rouge. Center for Wetlands Resources.
A Rationale for Determining Louisiana's Coastal Zone,
William G. McIntire, Marc J. Hershman, Rodney D. Adams, Kai D. Midboe, and Barney B. Barrett. Nov 75, 98p LSU-T-75-006, 1, NOAA-76042004

Descriptors: *Coastal zone management, *Louisiana, Boundaries, Land use, Regional planning, Land use zoning, Land surveys, Flood plain zoning, Legislation.
Identifiers: Sea Grant program.

This report presents relevant information and provides a rationale for eventual boundary delineation. A preliminary best-fit boundary line is included; however, the primary purpose of this report is to provide a compendium of data which will be useful in making the final boundary decision. Criteria for boundary delineation are presented on the basis of legal/governmental and biophysical considerations.

PB-255 336/0GA PC$5.00/MF$3.00
Hawaii Univ., Honolulu.
Hawaii Coastal Zone Management Program: Technical Supplement 1. Hawaiian Coastal Water Ecosystems: An Element Paper for the Hawaii Coastal Zone Management Study,
J. E. Maragos. Jun 75, 89p NOAA-76032404
See also PB-255 337.

Descriptors: *Coastal zone management, *Ecology, *Hawaii, Ocean environments, Conservation, Shores, Benthonic zone, Estuaries, Beaches.
Identifiers: *Ecosystems, Wetlands.

The report describes the general characteristics of ecosystems inhabiting fresh or marine waters of Hawaii's Coastal Zone. Each of the approximately 25 types of coastal water ecosystems can be conveniently placed under inland, shoreline, or offshore categories. The distribution, status, and importance of human derived impacts on each type are described. These stresses are used as the criteria for purposes of defining the inland boundary with respect to coastal water ecosystem management. The distinction is made that natural ecosystems are in a sense capable of perpetuating themselves and that it is man's influence on these systems which require control or management.

PB-255 337/8GA PC$4.50/MF$3.00
Hawaii Univ., Honolulu. Water Resources Research Center.
Hawaii Coastal Zone Management Program: Technical Supplement 2. Management of Hawaii's Coastal Zone for Water Quality Objectives,
P. H. McGauhey, and L. Stephen Lau. Aug 75, 54p NOAA-76032405
Prepared for Hawaii State Dept. of Planning and Economic Development, Honolulu. See also PB-255 336 and PB-255 338.

Descriptors: *Coastal zone management, *Water quality, *Hawaii, Water pollution, Waste water, Sewage treatment, Ocean environments, Sewage disposal, Boundaries, Runoff, Ground water, Land use.

The paper presents an overview of wastewater management as related to the quality of Hawaii's coastal waters. It examines concepts for establishing an inland boundary of the coastal zone, and reflects some of the results of studies made during the course of the 'Quality of Coastal Waters' project supported principally by the University of Hawaii Sea Grant Program during the years 1971 to 1975.

PB-255 338/6GA PC$3.50/MF$3.00
Hawaii Univ., Honolulu. Dept. of Botany.
Hawaii Coastal Zone Management Program: Technical Supplement 3. Vegetation as an Element in the Management of the Coastal Zone,
Kent W. Bridges. Aug 75, 16p NOAA-76032406
Prepared for Hawaii State Dept. of Planning and Economic Development, Honolulu. See also PB-255 337 and PB-255 339.

Descriptors: *Coastal zone management, *Vegetation, *Hawaii, Plants(Botany), Climatology, Natural resources, Ecology, Coastal topographic features, Stability, Classifications.
Identifiers: Ecosystems.

The report gives an overview of the role that vegetation plays in outlining management plans. A summary of vegetation data is listed in the appendix of the text.

PB-255 339/4GA PC$4.00/MF$3.00
Hawaii Inst. of Geophysics, Honolulu.
Hawaii Coastal Zone Management Program: Technical Supplement 4. Beaches: A Component of the Coastal Zone,
Ralph Moberly. Aug 75, 40p NOAA-76032407
Prepared for Hawaii State Dept. of Planning and Economic Development, Honolulu. See also PB-255 338 and PB-255 340.

Descriptors: *Coastal zone management, *Beaches, *Hawaii, Landforms, Coastal berms, Beach erosion, Shore protection, Beach ridges, Ocean environments, Recommendations.

The report describes the beaches along the Hawaiian coasts and gives an overview of the uses that it has for man. One section lists the author's recommendations for management to protect them from future misuse.

PB-255 340/2GA PC$5.00/MF$3.00
Hawaii Univ., Honolulu.
Hawaii Coastal Zone Management Program: Technical Supplement 5. Inundations and Forces Caused by Tsunamis for the State of Hawaii, Observations and Statistical Predictions,
Charles L. Bretschneider, and Pieter G. Wybro. Aug 75, 99p NOAA-76032408
Prepared for Hawaii State Dept. of Planning and Economic Development, Honolulu. See also PB-255 339 and PB-255 341.

Descriptors: *Coastal zone management, *Tsunamis, *Earthquakes, *Hawaii, Seismic detection, History, Ocean waves, Predictions, Sites, Tables(Data), Statistical analysis, Flooding.

The study represents a particular evaluation of tsunami effects for the State of Hawaii. It is an engineering evaluation of the Tsunami problem and not necessarily a scientific evaluation. The study also includes an analysis of reported observations on past tsunamis based on a literature survey. Predictions were then made for higher possible water elevations and flooding for further tsunamis.

PB-255 341/0GA PC$4.50/MF$3.00
Hawaii Univ., Honolulu. Dept. of Geography.
Hawaii Coastal Zone Management Program: Technical Supplement 6. Enhancement of Coastal Recreational Opportunities: A Description of Present Coastal Recreational Usage, Constraints, Data and Research Possibilities in the State of Hawaii,
Allan Sommarstrom. Aug 75, 68p NOAA-76032409
Prepared for Hawaii State Dept. of Planning and Economic Development, Honolulu. See also PB-255 340 and PB-255 342.

Descriptors: *Coastal zone management, *Recreational facilities, *Hawaii, Parks, Recreation, Public land, Land use zoning, Tables(Data), User needs.

The report assesses the factors involved in the development of a workable approach to the enhancement of coastal recreational opportunities. The report is limited principally to coastal parks and coastal recreational user data because the staff in these divisions are fully devoted to dealing with recreational problems.

PB-255 342/8GA PC$5.00/MF$3.00
Hawaii Univ., Honolulu. Dept. of Anthropology.
Hawaii Coastal Zone Management Program: Technical Supplement 7. Coastal Zone Management and Historical Resources as Seen from an Anthropological Viewpoint,
Ross Cordy. Aug 75, 83p NOAA-76032410
Prepared for Hawaii State Dept. of Planning and Economic Development, Honolulu. See also PB-255 341 and PB-255 343.

Descriptors: *Coastal zone management, *History, *Social anthropology, *Hawaii, Sociology, Archaeology, Culture(Social sciences), Ethnology, Human behavior.

Historical resources are discussed in this paper in regard to the management of such resources in coastal zones of the Hawaiian Islands. The approach taken by the author is from an anthropologist's viewpoint and it is suggested that other disciplines be consulted for any coastal management planning. The report emphasizes the need for continued archaeological research to be able to provide more complete and comprehensive data of Hawaii's history.

PB-255 343/6GA PC$7.75/MF$3.00
Hawaii Univ., Honolulu.
Hawaii Coastal Zone Management Program: Technical Supplement 8. Identifying and Managing the Scenic Resources in Hawaii's Coastal Zone,
Luciano Minerbi. Aug 75, 217p NOAA-76032411
Prepared for Hawaii State Dept. of Planning and Economic Development, Honolulu. See also PB-255 342 and PB-255 344.

Descriptors: *Coastal zone management, *Coastal topographic features, *Esthetics, *Hawaii, Natural resources, Coastal engineering, Policies, Conservation, Land surveys, Sites, Landscaping, Design, Legislation, Protection.

The scope of the paper has been defined to include the following topics: (a) Designation of coastal features that characterize this management purpose; (b) designation of criteria potentially useful in establishing an inland boundary consistent with the purpose; (c) identification of land and water uses or other factors that threaten or impede the achievement of this management purpose; (d) survey of existing research relating to this management purpose; (e) determination of the information which would be required for implementation of a management program to achieve this purpose including an indication of information not presently available; (f) analysis of current agency responsibility for the achievement of the management purpose.

PB-255 344/4GA PC$4.00/MF$3.00
Hawaii Univ., Honolulu.

Hawaii Coastal Zone Management Program: Technical Supplement 9. An Economic Overview of the Coastal Zone Problems in Hawaii,
Laurence Miller, Jr. Aug 75, 47p NOAA-76032412
Prepared for Hawaii State Dept. of Planning and Economic Development, Honolulu. See also PB-255 343 and PB-255 345.

Descriptors: *Coastal zone management, *Economic analysis, *Hawaii, Budgeting, Market value, Natural resources, Taxes, Water rights, Conservation, Project planning, Objectives.

The paper examines the subject of coastal zone management in the State of Hawaii drawing on well established principles of economics and the existing literature on coastal matters. It aims in part at an overview of the subject: a complement to studies by geographers, marine biologists, and others of problems viewed from the standpoint of those specialities. Secondly, it summarizes briefly in nontechnical language the major economic realities and ideas relevant to coastal zone management. Considerable attention is given to the concept of 'market failure'. An attempt is made to explain the nature of the coastal zone problems in Hawaii as seen by an economist and to formulate some guidelines relevant to formulating a program for Hawaii.

PB-255 345/1GA PC$4.00/MF$3.00
Hawaii Univ., Honolulu.
Hawaii Coastal Zone Management Program: Technical Supplement 10. Coastal Zone Management in Hawaii: The Major Issues,
George Kent. Aug 75, 28p NOAA-76032413
Prepared for Hawaii State Dept. of Planning and Economic Development, Honolulu. See also PB-255 344 and PB-255 346.

Descriptors: *Coastal zone management, *Hawaii, Project planning, Objectives, Fishing, Ocean environments, Mining, Conservation, Management planning.

The report gives a very brief overview of the major issues and technical considerations involved in developing coastal zone management in Hawaii. Among these are outlined as follows: (a) management goals, (b) fishing, (c) manganese mining, (d) military uses, (e) conflict and conflicts of interest, (f) dominance, (g) management structures, (h) concept of ownership and control, and (i) a coastal management agency.

PB-255 346/9GA PC$3.50/MF$3.00
Hawaii Univ., Honolulu.
Hawaii Coastal Zone Management Program: Technical Supplement 11. Coastal Zone Conflict Management,
George Kent. Aug 75, 21p NOAA-76032414
Prepared for Hawaii State Dept. of Planning and Economic Development, Honolulu. See also PB-255 345.

Descriptors: *Coastal zone management, *Hawaii, Public administration, Conflict, Public relations, Management engineering, Management methods.

The paper makes recommendations for handling conflict in regards to coastal management problems. This is considered essential if the new management system is to be effective. The reasons for creating a place within the new coastal management system as listed in this paper are as follows: (1) It is expressed within the Coastal Zone Management Act of 1972. (2) There are benefits to be gained which are considered healthy for dealing with different interest groups. (3) A number of ways have already been suggested where such a system could fit into the program.

PB-255 349/3GA PC$5.50/MF$3.00
Urban Mass Transportation Administration, Washington, D.C. Office of Research, Development and Demonstration.
Future Scenarios for Urban Transportation.
Final rept.,
Michael Patrick Leahy. Aug 75, 120p UMTA-RDD-9-75-1

Descriptors: *Urban transportation, *Urban planning, Travel demand, Forecasting, Air pollution, Internal combustion engines, Exhaust emissions, Electric vehicles, Electric power demand, Street railroads, Energy conservation, Fuel consumption, Fuel economy, Research.
Identifiers: Modal split, Air quality.

The author finds that, between 1972 and 1990, urban passenger miles will greatly increase. This increased demand will be met by a particular modal split. Presently, these modes have certain characteristics. Unless the internal combustion auto meets the statutory emission standards, it will cause more air pollution harm than the diesel bus and electrified modes. Using total energy consumption comparisons, the internal combustion auto that meets DOT suggested fuel economy standards for 1980 (19.6 mpg) is twice as energy intensive as the diesel bus, three times as energy intensive as rapid rail and the electric bus, and five times as energy intensive as the electric car and the advanced GRT. If 47% of all urban travel is made on electrified modes in 1990, 1.6 billion barrels of petroleum can be saved, at a cost of 1.7% increase in anticipated electricity demand. The author concludes that to decrease energy consumption, improve urban air quality, and improve urban transportation, strategies should be aimed at achieving a transit and electric intensive modal split. Opportunities for action include (1) strongly supporting HR 8800, which, if passed, will appropriate $160 million for 5 years to the Energy Research and Development Administration (ERDA) for Electric Vehicle R and D; (2) working in cooperation with ERDA to develop an urban private passenger electric vehicle and improved battery powered electric bus.

PB-255 401/2GA PC$7.75/MF$3.00
Department of Transportation, Washington, D.C. Office of R and D Plans and Resources.
Analysis of Fiscal Year 1977 DOT Program by Policy and RD and D Management Objectives. Program Levels for Fiscal Years 1975, 1976, 1977. Volume 1.
Management rept. 1975-77.
Jun 76, 218p* DOT-TST-76-69.1
See also PB-243 700.

Descriptors: *Transportation, *Research management, Projects, Air transportation, Highway transportation, Rail transportation, Urban transportation, Traffic safety, Water transportation, Environmental issues, Fuel consumption, Transportation management, Federal budgets.

The analysis of the DOT budget requests for Fiscal Year 1977 is presented in terms of its relationship to DOT policy and RD&D objectives. These objectives are: (1) modernize regulation and legislation, (2) increase efficiency and service, (3) improve safety and security, (4) lessen unfavorable environmental impacts, (5) minimize adverse impacts on energy constraints, and (6) increase knowledge base. The total budget of $14.1 billion contains $367.7 millions for RD&D or about 2.6% of the total. The document consists of two volumes. Volume 1 contains narrative and fiscal descriptions of line item requests. Volume II provides tables and analyses from differing management perspectives.

PB-255 402/0GA PC$13.50/MF$3.00
Department of Transportation, Washington, D.C. Office of R and D Plans and Resources.
Analysis of Fiscal Year 1977 DOT Program by Policy and RD and D Management Objectives. Program Levels for Fiscal Years 1975, 1976, 1977. Volume 2.
Management rept. 1975-77.
Jun 76, 553p* DOT-TST-76-69.2
See also PB-255 401.

Descriptors: *Transportation, *Research management, Policies, Projects, Traffic safety, Environmental issues, Urban transportation, Fuel consumption, Transportation management, Federal budgets.

Contents:
RD&D management program analyses;
Policy and management program analyses;
Transportation safety program analyses.
Portions of this document are not fully legible.

PB-255 414/5GA PC$3.50
Hawaii Univ., Honolulu. Coll. of Tropical Agriculture.
Some Institutional Constraints to Coastal Zone Management. A Case Study of Hawaii,
Chennat Gopalakrishnan, and Justin Rutka. Jul 74, 9p UNIHI-SG-JC-75-01, NOAA-76032322
Grant NOAA-2-35243
Also pub. as Hawaii Agricultural Experiment Station, Honolulu Journal Series-1622. Pub. in The American Jnl. of Economics and Sociology, v33 n3 p225-232 Jul 74.

Descriptors: *Coastal zone management, *Hawaii, Coasts, Planning, Land use, Constraints.
Identifiers: Sea Grant program.

The pressures of different uses on Hawaii's coastal zone have been mounting dramatically in recent years, causing an increasing variety of management problems. This report examines the factors which impede the formulation and implementation of an effective system for optimum management of Hawaii's vital shoreline.

PB-255 419/4GA PC$5.00/MF$3.00
Texas Transportation Inst., College Station.
Incinerator Residue in Bituminous Base Construction.
Interim rept. Jun 74-Sep 75,
J. Haynes, and W. B. Ledbetter. Dec 75, 98p RF-968-1, FHWA/RD-76-12
Contract DOT-FH-11-8027

Descriptors: *Flexible pavements, *Aggregates, *Solid waste disposal, *Reclamation, Incinerators, Residues, Utilization, Performance tests, Refuse disposal, Cost estimates.
Identifiers: Litter.

The use of incinerator residue as an aggregate in a bituminous base pavement (termed littercrete) was studied. Following a laboratory investigation a test section consisting of the experimental hot-mixed littercrete pavement, and a conventional hot-mixed asphaltic concrete pavement were placed on a city street in Houston, Texas. The two pavements were covered with a 1 1/2 in. (3.8 cm) wearing surface. Samples were taken of the loose mix. Cores were taken after compaction (before traffic), and cores were taken after six months in service. Results of laboratory and field evaluations show that the littercrete pavement meets current specifications for asphalt stabilized materials and littercrete can be constructed using conventional equipment and technology. The littercrete pavement is performing as well as the conventional blackbase control pavement. The high cost of aggregates in certain areas has made the use of the littercrete pavement economically feasible and there are some intangible benefits associated with the use of incinerator residue.

PB-255 448/3GA PC$6.75/MF$3.00
Seattle Office of Management and Budget, Wash. Solid Waste/Methanol/Ammonia Project.
Seattle's Solid Waste - An Untapped Resource.
Final rept.,
Paul A. Wiatrak, and Gordon Vickery. May 74, 169p SWAP-74-1
Prepared by Seattle Dept. of Engineering, Wash., and Seattle Dept. of Lighting, Wash. See also PB-255 449.

Descriptors: *Solid waste disposal, *Materials recovery, *Economic analysis, Washington(State), Reclamation, Management planning, Fuels, Steam electric power generation, Incinerators, Hauling, Methyl alcohol, Operating costs, Capitalized costs, Metal scrap, Gas turbines, Electric power plants, Shredding, Classifiers, Refuse disposal.
Identifiers: Pyrolysis incineration, Waste transfer station, *Waste recycling, Seattle(Washington), Secondary materials industry.

This publication is an analysis of solid waste resource and energy production alternatives, including an overall total economic comparison of complete disposal system costs. Where solid waste processing allows material salvage, the revenues from material sales have been credited against disposal costs. The document presents 15 separate system alternatives investigated by the City of Seattle, leading to the designation of a pyrolysis/oxidation system for methanol production.

PB-255 449/1GA PC$10.50/MF$3.00
Seattle Office of Management and Budget, Wash. Solid Waste/Methanol/Ammonia Project.
Feasibility Study: Conversion of Solid Waste to Methanol or Ammonia.
Final rept.
Sep 74, 357p SWAP-74-2
Prepared by Mathematical Sciences Northwest, Inc., Seattle, Wash., Rept. no. MSNW-74-243-1. See also PB-255 450.

Descriptors: *Solid waste disposal, *Reclamation, *Fuels, *Ammonia, *Methyl alcohol, Chemical engineering, Incinerators, Oxidation, Economic analysis, Washington(State).
Identifiers: Pyrolysis incineration, *Waste recycling, Seattle(Washington).

This report examines one method of processing solid waste; gasification of waste in furnace-like equipment, using oxygen, and subsequent treatment of the product gas in a chemical process plant to make industrial grade methanol (methyl alcohol) or anhydrous ammonia. The gasification-chemical synthesis concept is one of the latest in the increasingly more complex processes that solid waste utilities are considering or have placed in use. The following subjects are covered: technical assessment of waste conversion, technical assessment of conversion product uses, siting considerations, product market assessment, and financial analysis.

PB-255 450/9GA PC$9.25/MF$3.00
Seattle Office of Management and Budget, Wash. Solid Waste/Methanol/Ammonia Project.
Solid Waste to Methanol/Ammonia Conversion Plant.
Final environmental impact statement.
Oct 75, 290p SWAP-75-1

Descriptors: *Solid waste disposal, *Materials recovery, *Reclamation, *Fuels, Washington(State), Ammonia, Methyl alcohol, Chemical engineering, Metal scrap, Incinerators, Management planning, Shredding, Separation, Hauling, Site surveys, Design, Environmental impacts, Boilers, Capitalized costs, Operating costs, Cost estimates.
Identifiers: Pyrolysis incineration, *Waste recycling, Metal recycling, Secondary materials industry, Waste transfer stations, Seattle(Washington).

The City of Seattle proposes to construct a new plant to process solid waste that will eliminate total dependence by the City on landfills as the means for disposal. The facility will use recently developed processes to extract useful material from the waste. Solid waste will be ground-up, ferrous metal will be extracted for sale in the secondary metals market, the ground waste will be pyrolyzed, and the pyrolysis gas will be converted to useful chemicals for sale in the chemical market. The plant will have the general appearance of a small chemical plant. If constructed, this new process will reduce land requirements for solid waste disposal and generate useful chemicals that are now produced exclusively from natural gas. This document is an environmental impact statement for the proposed project which was selected from among 15 alternatives previously examined by the City.

PB-255 451/7GA PC$6.00/MF$3.00
Voorhees (Alan M.), and Associates, Inc., Berkeley, Calif.
City of Napa Local Needs and Planning Study.
May 74, 147p UMTA-CA-09-0025-74-1

Descriptors: *Urban transportation, Central city, Mobility, Minority groups, Elderly persons, Handicapped persons, Routes, Services, Buses(Vehicles), Urban planning, California.
Identifiers: Napa(California), Small cities.

The transit objectives of the city of Napa, California, as defined is this report, are: (1) To increase the transit mobility of all persons, including those especially dependent on transit--the poor, the handicapped, the young and senior citizens; (2) to increase transit service, particularly to the downtown area where most trips converge and to South Napa where many work and school trips converge; (3) to promote transit as a more important factor in achieving an improved environment, and a generally better community in which to live; and (4) to insure that Napa Transit System complements the transportation systems existing and envisioned for the County and Region. The primary goal of this particular study is to design a transit system which meets the transit objectives as stated above. Chapters address data collection, evaluation criteria, three alternatives, evaluation and recommendations, and implementation. System requirements and phasing over five years are discussed.

PB-255 452/5GA PC$4.00/MF$3.00
National Association of Counties, Washington, D.C.
Preparing for Anticipated Growth. Greene County, Pennsylvania. NACo Case Studies on Energy Impacts Number 3,
Kimberly A. Campbell. May 76, 40p FEA/E-76/316
Contract FEA-CO-12-60509-00

Descriptors: *Regional planning, *Rural areas, *Coal mining, *Economic impact, *Environmental impacts, Economic development, Pennsylvania, Local government.
Identifiers: *Greene County(Pennsylvania).

The study of Greene County, Pennsylvania is the third in a series of case studies on energy-impacted communities. These studies are designed to familiarize officials of counties with potential for energy development with efforts of other counties that are either currently experiencing or expect to experience development. There are several possible means to meet the development impacts and as many variations on them as there are impacted counties. Since the specifics must vary greatly according to State and local laws (tax limitations, placement of authority, and constitutional constraints), the study will stress the process of preparing for impacts rather than detailed projections. Greene County was selected for this study for several reasons. Located in the Appalachian coal region it is a rural county economically dependent upon the coal industry. After declining in the 1950's, the industry is booming again -- one of its areas of expansion is Greene County. Several large mining companies are purchasing mineral rights throughout the county and three multi-million dollar mines are already scheduled to begin operations within the next five years. The development of the mines and the resulting impacts have not yet occurred; however, the county leaders have begun to think about the problems they will be faced with in the future.

PB-255 456/6GA PC$8.00/MF$3.00
NATO Committee on the Challenges of Modern Society, Brussels (Belgium).
Air Pollution: Appendix C - Assessment of Air Quality in Frankfurt, Federal Republic of Germany (Lufthygienisch-meteorologische Modelluntersuchung in der Region Untermain 5. Arbeitsbericht).
Jun 74, 250p NATO/CCMS-6-App-C
Sponsored in part by Environmental Protection Agency, Washington, D.C. Text in English and German. NATO furnished. See also Appendix B, PB-240 567.

Descriptors: *Air pollution abatement, *Regional planning, *West Germany, United States, Assessments, Surveys, Comparison, Metropolitan areas, Monitoring, Inventories, Climatology.
Identifiers: Air quality maintenance, *Frankfurt(West Germany).

In March 1970 the USA, Turkey, and West Germany decided to conduct comparative studies within the framework of an air pollution program. They wanted to demonstrate that it was possible to judge the status of the air in congested areas with the scientific instrumentarium available and that it was possible to draw principles for the planning of air quality from these results. This study differed from the previous two in that under regional planning need had grown to receive more information on the influence of settlement activities upon climatological and air quality conditions in congested areas. The aim was to get an instrument for decision for regional planning. The study, like the other two, looks at emission inventories and networks.

PB-255 460/8GA PC$5.50/MF$3.00
Cramer (H. E.) Co., Inc., Salt Lake City, Utah.
West Virginia Power Plant Evaluation,
H. E. Cramer, and J. F. Bowers, Jr. May 76, 104p EPA/903/9-75/022

Descriptors: *Electric power plants, *Air pollution, Sulfur dioxide, Sulfur oxides, Plume behavior, Flue gases, Atmospheric models, Mathematical models, West Virginia.
Identifiers: Gaussian plume models, Kammer Electric Power Plant, Mitchell Electric Power Plant, Marshall County(West Virginia).

Using a Gaussian diffusion model, the authors made calculations of the effects of the Mitchell and Kammer power plants on ambient air quality. The highest predicted 24 hour average SO2 level is 1219 micrograms/cubic meter. Comparisons between model calculations and measurements made by EPA's Las Vegas laboratory are shown. Excellent agreement is shown for plume rise, axial concentration, and ground level concentration.

PB-255 469/9GA PC$3.50
Hawaii Agricultural Experiment Station, Honolulu.
Pesticide Residues in Our Waters,
A. Bevenue, J. W. Hylin, and T. W. Kelley. 1971, 4p UNIHI-SG-JC-73-16, NOAA-76032317
Pub. in Hawaii Farm Science, Agricultural Progress Quarterly, v20 n3 p1-3 1971.

Descriptors: *Insecticide, *Water pollution, *Herbicides, *Hawaii, Pesticides, Chlorine organic compounds, Water quality, Water analysis.
Identifiers: Reprints, Sea Grant program.

The Hawaiian state legislature has encouraged research to maintain safety standards of the water and to establish a water quality criteria. This article presents data on chlorinated organic insecticides as water pollutants in Hawaiian state waters. This report is based on a preliminary survey of water samples randomly selected.

PB-255 477/2GA PC$5.50/MF$3.00
Ohio River Div. Labs., Cincinnati.
A Test of Proposed Procedures for Evaluation of Water and Related Land Resources Projects. A Special Study of Stonewall Jackson Lake, West Fork River and Tributaries, West Virginia.
Mar 70, 124p
Prepared in cooperation with Army Engineer District, Pittsburgh, Pa. Sponsored by Water Resources Council, Washington, D.C.

Descriptors: *Water resources, *Land use, *Stonewall Jackson Lake, Project planning, Standards, Objectives, Benefit cost analysis, Recreation, Economic development, West Virginia.

The purpose of the report is to determine the advisability of modifying a previously authorized reservoir located between Weston and Clarksburg, W. Va. It includes the guidelines and measurement of the effects of the project for Stonewall Jackson Lake.

PB-255 491/3GA PC$4.50/MF$3.00
Plainfield City Planning Div., N.J.
Plainfield Transit Center. Engineering Feasibility Study.
Sep 73, 64p UMTA-IT-09-0014-73-2
Prepared in cooperation with Edwards and Kelcey, Inc., Newark, N.J.

Descriptors: *Rail transportation, *Passenger transportation, *Passenger terminals, Railroad terminals, Urban planning, Services, Consolidation, Economic analysis, New Jersey, New York.
Identifiers: Plainfield(New Jersey).

The city of Plainfield is served by the main line of the Central Railroad of New Jersey. Four passenger stations, three of which are currently in operation, are located within the city limits. Presently, plans are being developed to replace the Central Railroad of New Jersey passenger service by an extension of the Port Authority of New York and New Jersey PATH services. Plainfield is located southwest of Manhattan and Newark and serves as the center of activity of several municipalities in Union, Middlesex and Somerset Counties. Many of the residents of this subregion utilize the Plainfield passenger stations to commute to Newark and Manhattan. The purpose of the study was to develop a plan for the consolidation of transportation services in Plainfield, New Jersey, and to determine the engineering and economic feasibility of constructing a transit center in the future.

PB-255 493/8GA PC$5.00/MF$3.00
Wisconsin Univ., Madison. Center for Resource Policy Studies and Programs.
Procedures for Evaluation of Water and Related Land Resource Projects: An Analysis of the Water Resources Council's Task Force Report,
Daniel W. Bromley, William B. Lord, Dinesh Sharma, F. A. Clarenbach, and Fred Bennett. 1 Apr 70, 93p
Sponsored in part by Water Resources Council, Washington, D.C.

Descriptors: *Water resources, *Land use, *Project planning, Irrigation, Flood control, Water supply, Recreation, Wildlife, Economic development, Standards, Evaluation, Idaho.

The report is seeking a full analysis of the problems and processes involved in measuring effects and formulating projects for water and related land resources. The Southwest Idaho Water development project was used as a case study.

PB-255 496/2GA PC$10.00/MF$3.00
Southwest Research Inst., San Antonio, Tex.
Emissions from Diesel and Stratified Charge Powered Cars.
Final rept.,
Karl J. Springer. Dec 74, 333p SWRI-AR-975, EPA/460/3-75/001-a
Contract PH-22-68-23

Descriptors: *Air pollution, *Automobiles, *Diesel fuels, *Stratified charge engines, Hydrocarbons, Gas analysis, Exhaust emissions, Smoke, Noise, Odors, Carbon monoxide, Tables(Data), Gasoline, Fuel consumption, Measuring instruments.
Identifiers: Light duty vehicles, Heavy duty vehicles, Catalytic reactors(Exhaust systems).

A total of ten passenger cars, four powered by diesel engines, two by stratified charge gasoline engines, one by a stratified charge operating on gasoline and diesel fuel, two by control equipped conventional engines, and one powered by a gas turbine, have been subjected to a wide variety of emissions evaluations. The vehicles, all late model, low mileage, included a Nissan Datsun, a Mercedes 220D, a Peugeot 504D, an Opel Rekord 2100D, a standard Capri, a stratified charge (PROCO) Capri, a low emission prototype Ford LTD, the Texaco TCCS stratified charge powered Cricket operated on gasoline and on diesel fuel, a Honda CVCC stratified charge, and a Chrysler gas turbine car. All were 4-cylinder except the LTD and the gas turbine. Tailpipe emissions were measured by the 1975 light duty Federal Test Procedure for gaseous emissions. Smoke and fuel economy were also determined during this test cycle. Odor and related instrumental-chemical measurements were made under seven steady state and three acceleration conditions. Noise measurements were taken by SAE driveby as well as under a variety of exterior-interior conditions. Comparisons of the results for all vehicles are by emission category. The emissions from the group of diesel cars are compared to the conventional gasoline, Ford PROCO, Texaco TCCS, and Honda CVCC.

PB-255 498/8GA PC$5.50/MF$3.00
Michigan Univ., Ann Arbor. School of Natural Resources.
An Analysis of Federal Water Resource Planning and Evaluation Procedures,
Gunter Schramm, and Robert E. Burt, Jr. Jun 70, 114p

Descriptors: *Water resources, *Project planning, *Susquehanna River, Regional planning, Income, Economic development, Objectives, Environmental impacts, Recommendations, Evaluation, Pennsylvania.

The purpose of the report was to test a set of new water resources plan and project evaluation procedures published by the Special Task Force for June 1969. The seminar used a designated stretch of the Susquehanna between Pittston and Sayres, Pennsylvania as the focal point of the investigation.

PB-255 506/8GA
Mag Tape $100.00;Foreign $122.50
Environmental Research and Technology, Inc., Santa Barbara, Calif.
Los Angeles Reactive Pollutant Program Data - Modelers' Archive. September 1973-November 1973.
Data file,
Alan Eschenroeder, and J. Raul Martinez. Nov 73, mag tape ERT-P-1656/4, NTIS/DF-76/002
See also PB-255 508 thru PB-255 514, PB-244 296, PB-244 297.
Source tape is in EBCDIC character set. Tape(s) can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions. Price includes documentation PB-255 507.

Descriptors: *Data file, *Air pollution, *Data acquisition, California, Smog, Municipalities, Meteorological data, Magnetic tapes.
Identifiers: *Los Angeles(California), Vertical profiles, *Air quality data, *Los Angeles reactive pollutant program.

This file, the Modelers' Archive, is the second of two data files which contain the data collected by the Los Angeles Reactive Pollutant Program (LARPP) during the summer and early fall of 1973. The program was sponsored by the Coordinating Research Council, Inc., and its goal was to obtain a three-dimensional description of the various stages in the buildup of air pollutants in the Los Angeles area. A previous data file by the same title was issued in September of 1975. This is a companion to the earlier file. This file contains: (1) vertical profiles of average pollutant concentration; (2) vertical profiles of average and instantaneous temperature and humidity data; (3) positional data for the tetroons used to track a moving air mass; (4) printer plots of vertical profile data. A seven volume document is also available which describes the Modelers' Archive in detail.

PB-255 507/8GA PC$4.50/MF$3.00
Environmental Research and Technology, Inc., Santa Barbara, Calif.
Los Angeles Reactive Pollutant Program (LARPP) Guide to Modelers' Archive.
Task rept. Jul 75-Jun 76,
J. R. Martinez. May 76, 66p ERT-P-1656/2, NTIS/DF-76/002a
For data file on magnetic tape, see PB-255 506.
See also PB-244 295. Prepared in cooperation with Coordinating Research Council, Inc., New York.

Descriptors: *Air pollution, *Data acquisition, California, Smog, Municipalities, Meteorological data, Statistical data, Manuals.
Identifiers: *Los Angeles(California), Airborne measurement, *Los Angeles reactive pollutant program, Vertical profiles, *Air quality data.

The Guide to the Modelers' Archive is the second of two reports which describe the data collected by the Los Angeles Reactive Pollutant Program (LARPP) during the summer and early fall of 1973. The goal was to obtain a three-dimensional description of the various stages in the buildup of air pollutants in the Los Angeles area. A previous report entitled LARPP Data Archiving and Retrieval was issued in September 1975; the present work is a companion to that volume. The archive contains: (1) vertical profiles of average pollutant concentration; (2) vertical profiles of average and instantaneous temperature and humidity data; (3) positional data for the tetroons used to track a moving air mass; and (4) printer plots of vertical

profile data. Detailed explanations are provided of the procedures used to process the data for inclusion in the archive. Examples of the contents of the archive are given. Examples are given of the use of a generalized data retrieval computer program to read the Modelers' Archive data stored on magnetic tape.

PB-255 508/4GA PC$10.00/MF$3.00
Environmental Research and Technology, Inc., Santa Barbara, Calif.
Modelers' Archive for Los Angeles Reactive Pollutant Program (LARPP) Data, Volume I. Operations 1,4,5,6,7,8.
Data rept. Jul 75-Jun 76,
G. M. Houser, J. R. Martinez, G. H. Taylor, and K. T. Tran. May 76, 337p ERT-P-1656/1-Vol-1, NTIS/DF-76/002b
For data file on magnetic tape see PB-255 506. See also Volume 2, PB-255 509. Prepared in cooperation with Coordinating Research Council, Inc., New York.

Descriptors: *Air pollution, Aerial surveys, Data acquisition, California, Smog, Meteorological data, Statistical data, Tables(Data).
Identifiers: *Los Angeles(California), *Los Angeles reactive pollutant program, *Air quality data.

This report presents the Los Angeles Reactive Pollutant Program data in a user-oriented tabular and graphical form. Because of the volume of data contained in this report, it was necessary to separate it into 7 volumes. The LARPP operations contained in each volume are as follows: volume 1, operations 1 through 8; volume 2, operations 9 through 13; volume 3, operations 14 through 17; volume 4, operations 18 through 23; volume 5, operations 24 through 26; volume 6, operations 27-31; and volume 7, operations 32 through 35. Portions of this document are not entirely legible.

PB-255 509/2GA PC$9.25/MF$3.00
Environmental Research and Technology, Inc., Santa Barbara, Calif.
Modelers' Archive for Los Angeles Reactive Pollutant Program (LARPP) Data. Volume 2. Operations 9,10,11,12,13.
Data rept. Jul 75-Jun 76,
G. M. Houser, J. R. Martinez, G. H. Taylor, and K. T. Tran. May 76, 296p ERT-P-1656/1-Vol-2, NTIS/DF-76/002c
For data file on magnetic tape see PB-255 506. See also Volume 1, PB-255 508 and Volume 3, PB-255 510. Prepared in cooperation with Coordinating Research Council, Inc., New York.

Descriptors: *Air pollution, Aerial surveys, Data acquisition, California, Smog, Meteorological data, Statistical data, Tables(Data).
Identifiers: *Los Angeles(California), *Los Angeles reactive pollutant program, *Air quality data.

This report presents the Los Angeles Reactive Pollutant Program data in a user-oriented tabular and graphical form. Because of the volume of data contained in this report, it was necessary to separate it into 7 volumes. The LARPP operations contained in volume 2 are operations 9 through 13. Portions of this document are not entirely legible.

PB-255 510/9GA PC$9.75/MF$3.00
Environmental Research and Technology, Inc., Santa Barbara, Calif.
Modelers' Archive for Los Angeles Reactive Pollutant Program (LARPP) Data. Volume 3. Operations 14,15,16,17.
Data rept. Jul 75-Jun 76,
G. M. Houser, J. R. Martinez, G. H. Taylor, and K. T. Tran. May 76, 322p ERT-P-1656/1-Vol-3, NTIS/DF-76/002d
For data file on magnetic tape see PB-255 506. See also Volume 2, PB-255 509 and Volume 4, PB-255 511. Prepared in cooperation with Coordinating Research Council, Inc., New York.

Descriptors: *Air pollution, Aerial surveys, Data acquisition, California, Smog, Meteorological data, Statistical data, Tables(Data).
Identifiers: *Los Angeles(California), *Los Angeles reactive pollutant program, *Air quality data.

This report presents the Los Angeles Reactive Pollutant Program data in a user-oriented tabular and graphical form. Because of the volume of data contained in this report, it was necessary to separate it into 7 volumes. The LARPP operations contained in volume 3 are operations 14 through 17. Portions of this document are not entirely legible.

PB-255 511/8GA PC$9.25/MF$3.00
Environmental Research and Technology, Inc., Santa Barbara, Calif.
Modelers' Archive for Los Angeles Reactive Pollutant Program (LARPP) Data. Volume 4. Operations 18,19,20,21,22,23.
Data rept. Jul 75-Jun 76,
G. M. Houser, J. R. Martinez, G. H. Taylor, and K. T. Tran. May 76, 294p ERT-P-1656/1-Vol-4, NTIS/DF-76/002e
For data file on magnetic tape see PB-255 506. See also Volume 3, PB-255 510 and Volume 5, PB-255 512. Prepared in cooperation with Coordinating Research Council, Inc., New York.

Descriptors: *Air pollution, Aerial surveys, Data acquisition, California, Smog, Meteorological data, Statistical data, Tables(Data).
Identifiers: *Los Angeles(California), *Los Angeles reactive pollutant program, *Air quality data.

This report presents the Los Angeles Reactive Pollutant Program data in a user-oriented tabular and graphical form. Because of the volume of data contained in this report, it was necessary to separate it into 7 volumes. The LARPP operations contained in volume 4 are operations 18 through 23. Portions of this document are not entirely legible.

PB-255 512/6GA PC$9.25/MF$3.00
Environmental Research and Technology, Inc., Santa Barbara, Calif.
Modelers' Archive for Los Angeles Reactive Pollutant Program (LARPP) Data. Volume 5. Operations 24,25,26.
Data rept. Jul 75-Jun 76,
G. M. Houser, J. R. Martinez, G. H. Taylor, and K. T. Tran. May 76, 280p ERT-P-1656/1-Vol-5, NTIS/DF-76/002f
For data file on magnetic tape, see PB-255 506. See also Volume 4, PB-255 511 and Volume 6, PB-255 513. Prepared in cooperation with Coordinating Research Council, Inc., New York.

Descriptors: *Air pollution, Aerial surveys, Data acquisition, California, Smog, Meteorological data, Statistical data, Tables(Data).
Identifiers: *Los Angeles(California), *Los Angeles reactive pollutant program, *Air quality data.

This report presents the Los Angeles Reactive Pollutant Program data in a user-oriented tabular and graphical form. Because of the volume of data contained in this report, it was necessary to separate it into 7 volumes. The LARPP operations contained in volume 5 are operations 24 through 26. Portions of this document are not fully legible.

PB-255 513/4GA PC$9.75/MF$3.00
Environmental Research and Technology, Inc., Santa Barbara, Calif.
Modelers' Archive for Los Angeles Reactive Pollutant Program (LARPP) Data. Volume 6. Operations 27,28,29,30,31.
Data rept. Jul 75-Jun 76,
G. M. Houser, J. R. Martinez, G. H. Taylor, and K. T. Tran. May 76, 308p ERT-P-1656/1-Vol-6, NTIS/DF-76/002g
For data file on magnetic tape see PB-255 506. See also Volume 5, PB-255 512 and Volume 7, PB-255 514. Prepared in cooperation with Coordinating Research Council, Inc., New York.

Descriptors: *Air pollution, Aerial surveys, Data acquisition, California, Smog, Meteorological data, Statistical data, Tables(Data).
Identifiers: *Los Angeles(California), *Los Angeles reactive pollutant program, *Air quality data.

This report presents the Los Angeles Reactive Pollutant Program data in a user-oriented tabular and graphical form. Because of the volume of data contained in this report, it was necessary to separate it into 7 volumes. The LARPP operations contained in volume 6 are operations 27 through 31. Portions of this document are not entirely legible.

PB-255 514/2GA PC$9.75/MF$3.00
Environmental Research and Technology, Inc., Santa Barbara, Calif.
Modelers' Archive for Los Angeles Reactive Pollutant Program (LARPP) Data. Volume 7. Operations 32,33,34,35.
Data rept. Jul 75-Jun 76,
G. M. Houser, J. R. Martinez, G. H. Taylor, and K. T. Tran. May 76, 314p ERT-P-1656/1-Vol-7, NTIS/DF-76/002h
For data file on magnetic tape, see PB-255 506. See also Volume 6, PB-255 513. Prepared in cooperation with Coordinating Research Council, Inc., New York.

Descriptors: *Air pollution, Aerial surveys, Data acquisition, California, Smog, Meteorological data, Statistical data, Tables(Data).
Identifiers: *Los Angeles(California), *Los Angeles reactive pollutant program, *Air quality data.

This report presents the Los Angeles Reactive Pollutant Program data in a user-oriented tabular and graphical form. Because of the volume of data contained in this report, it was necessary to separate it into 7 volumes. The LARPP operations contained in volume 7 are operations 32 through 35. Portions of this document are not entirely legible.

PB-255 537/3GA PC$5.50/MF$3.00
California State Office of Planning and Research, Sacramento.
A State Role in Community Development.
Jun 76, 119p* EDA-76-016

Descriptors: *Technical assistance, *Community development, *California, State government, Government policies, Urban planning, Coordination, States(United States), Local government, Federal assistance programs, Management planning.

The purpose of the report is to examine how state government can become more responsive to local and urban needs through its policies, plans and programs. While federal programs are being organized to meet local comprehensive community development needs, state programs continue emphasis on many objectives.

PB-255 541/5GA PC$6.00/MF$3.00
Pratt Inst., Brooklyn, N.Y.
Urban Design and Usage Factors of Paratransit Vehicles and Facilities.
Final rept.,
Ronald Adams, and George Hildebrand. Apr 76, 150p UMTA-NY-11-0011-76-1

Descriptors: *Urban transportation, Safety, Human factors engineering, Elderly persons, Handicapped persons, Passenger terminals,

Vehicles, Traffic engineering, Electric propulsion, Urban planning.
Identifiers: *Paratransit, Demand responsive transportation systems, Multimodal transportation.

The study explores history and future of equipment and facilities for paratransit usage, focusing particularly on facilities for demand responsive services. Relevant technology development programs are discussed along with safety, human factors and operators' concerns, with special attention to boarding considerations of the elderly and handicapped. A spectrum of vehicles is conceptualized for single and multi-party service in both near and mid-term time frames, and in specialized versions to accommodate elderly/handicapped and general population. Local, line-haul and terminal facilities for paratransit vehicles are examined including ubiquitous treatments to support elderly/handicapped access, integration in high traffic, multi-modal terminal facilities; priority and exclusive rights-of-way with the long-term prospect of wayside power to overcome limitations of chemical battery storage; introduction of electric-powered vehicles.

PB-255 553/0GA PC$5.00/MF$3.00
Bureau of Reclamation, Washington, D.C.
Report to the Water Resources Council by the Bureau of Reclamation Test Team on Special Task Force Report on Procedures for Evaluation of Water and Related Land Resource Projects.
Paul T. Sant, William E. Crosby, Don Justus, Dale Hoffman, and Richard Eggen, Mar 70, 95p
Prepared in cooperation with Water Resources Council, Washington, D.C. See also PB-209 171.

Descriptors: *Water resources, *Land use, Regional planning, Research projects, Standards, Irrigation, Flood control, Water quality, Recreation, Benefit cost analysis, Income, Environmental impacts, California.

The purpose of this report is to test the procedures developed by the Special Task Force of the Water Resource Council for the evaluation of water and related land resource projects using the Consumnes River Division of the Central Valley Project, California for testing.

PB-255 556/3GA PC$10.00/MF$3.00
Automotive Testing Labs., Inc., Aurora, Colo.
An Evaluation of High Altitude Engine Modification Devices (Econo-Kit).
Mar 76, 340p
Contract EPA-68-02-2315

Descriptors: *Automobile engines, *Exhaust emissions, *Air pollution control equipment, Performance tests, Elevation, Regional geography, Methodology, Adjusting, Modification kits, Motor vehicle engines, Nitrogen oxides, Carburetors, Timing devices, Ignition, Colorado, Altitude.
Identifiers: Rocky Mountain Region(United States), High altitude areas.

In Colorado and other high altitude areas, the motor vehicle plays a disproportionate and adverse role in atmospheric pollution due to fuel enrichment and other inherent factors associated with engine operation in these areas. As a consequence, a sizeable program is required, not only for emission reduction in elevated areas, but for fuel economy improvement as well. The report deals with the devices, which include certain parametric adjustments to help compensate for the high altitude effect on carburetion and combustion in the conventional automobile engine.

PB-255 559/7GA PC$4.00/MF$3.00
Automotive Testing Labs., Inc., Aurora, Colo.
High Altitude Vehicular Emission Control Program. Volume I. Executive Summary.
Final rept.
Jan 74, 40p
Contract EPA-68-02-0048, Grant EPA-C-290526
Sponsored in part by Colorado State Dept. of Public Health, Denver. Prepared in cooperation with TRW, Inc., McLean, Va. Transportation and Environmental Operations, and Olson Labs., Inc., Anaheim, Calif.
Also available in set of 7 reports as PB-255 558-SET, PC$42.25/MF$9.75.

Descriptors: *Motor vehicle engines, *Exhaust emissions, *Air pollution abatement, Altitude, Regional geography, Projects, Objectives, Methodology, Research, Data acquisition, Colorado, Hydrocarbons, Carbon monoxide, Nitrogen oxides, Fuel consumption.
Identifiers: High altitude areas, *Denver(Colorado), Alternatives, Motor vehicle inspection, Motor vehicle maintenance.

A seven volume report discusses motor vehicle emissions in a high altitude area, covering engine characteristics, pollution control planning, retrofit programs, inspection systems, emissions measurement, fuel system adjustment, and altitude effects. Volume 1 summarizes the general objectives, approach and results of a study in the Denver, Colorado, area.

PB-255 560/5GA PC$8.00/MF$3.00
Automotive Testing Labs., Inc., Aurora, Colo.
High Altitude Vehicular Emission Control Program. Volume II. Experimental Characterization of Idle Inspection, Exhaust Control Retrofit and Mandatory Engine Maintenance.
Final rept.
Dec 73, 235p
Contract EPA-68-02-0048, Grant EPA-C-290526
Sponsored in part by Colorado State Dept. of Public Health, Denver.
Also available in set of 7 reports as PB-255 558-SET, PC$42.25/MF$9.75.

Descriptors: *Motor vehicles, *Exhaust emissions, *Air pollution abatement, Projects, Evaluation, Effectiveness, Altitude, Automobiles, Revisions, Specifications, Experimental data, Maintenance, Regulations, Surveys, Methodology, Hydrocarbons, Carbon monoxide, Nitrogen oxides, Motor vehicle engines, Adjusting, Air pollution control equipment, Cost effectiveness, Inspection, Comparison, Colorado.
Identifiers: *Denver(Colorado), High altitude areas, Retrofitting, Engine idle data, Motor vehicle inspection, Motor vehicle maintenance, Mandatory motor vehicle maintenance.

A sample of 300 of the 1964 through 1973 model-year vehicles was utilized to investigate the effectiveness and feasibility of several exhaust emission control strategies as might be applied in the Colorado environment. Four strategies were evaluated; idle emissions inspection in the private sector, exhaust control retrofit, modified engine tuning specifications and mandatory engine maintenance. Each of the strategies is discussed for effectiveness in reducing exhaust hydrocarbon, carbon monoxide, and oxides of nitrogen emissions.

PB-255 561/3GA PC$4.00/MF$3.00
Automotive Testing Labs., Inc., Aurora, Colo.
High Altitude Vehicular Emission Control Program. Volume III. Impact of Altitude on Vehicular Exhaust Emissions.
Final rept.
Dec 73, 48p
Grant EPA-C-290526
Sponsored in part by Colorado State Dept. of Public Health, Denver. Prepared in cooperation with TRW, Inc., McLean, Va. Transportation and Environmental Operations.
Also available in set of 7 reports as PB-255 558-SET, PC$42.25/MF$9.75.

Descriptors: *Motor vehicles, *Exhaust emissions, *Regional geography, Altitude, Impact, Surveys, Colorado, Hydrocarbons, Nitrogen oxides, Carbon monoxide, Urban areas, Standards, Mathematical analysis, Statistical samples, Data acquisition, Correlations.
Identifiers: *Denver(Colorado), High altitude areas, Motor idle data, Motor vehicle inspection, Motor vehicle maintenance, Mandatory motor vehicle maintenance.

Emission data were developed from a sample of resident vehicles in Leadville, Colorado at a nominal elevation of 10,000 feet above sea-level. Emissions concentration sampling was performed on each vehicle in the sample at loaded and unloaded engine operating conditions. Concentration data were then converted to mass data using equations developed from key-mode and mass emissions testing of vehicles operating in the Denver area. Mass emissions data were then combined with mass data developed from vehicles operating in a metropolitan area situated near sea-level (Chicago) to define the emissions versus altitude relationships for exhaust HC, CO and NOx. HC and CO emissions at idle were also examined with respect to the applicability of a statewide minimum HC/CO idle emission standard for the state of Colorado.

PB-255 562/1GA PC$6.00/MF$3.00
TRW, Inc., McLean, Va. Transportation and Environmental Operations.
High Altitude Vehicular Emission Control Program. Volume IV. Analysis of Experimental Results.
Final rept.
Dec 73, 143p
Contract EPA-68-02-0048
Sponsored in part by Colorado State Dept. of Public Health, Denver. Prepared in cooperation with Automotive Testing Labs., Inc., Aurora, Colo.
Also available in set of 7 reports as PB-255 558-SET, PC$42.25/MF$9.75.

Descriptors: *Motor vehicle engines, *Exhaust emissions, *Air pollution abatement, Experimental data, Maintenance, Adjusting, Altitude, Deterioration, Data acquisition, Colorado, Inspection, Regulations, Cost effectiveness, Tests, Methodology.
Identifiers: *Denver(Colorado), High altitude areas, Motor idle data, Retrofitting, Motor vehicle inspection, Motor vehicle maintenance.

This document provides a quantitative assessment of the results of the High Altitude Emission Test Program. The primary objectives of this program were twofold. First, to determine the impact of a series of experimental procedures on vehicular exhaust emissions, and second, to identify those specific procedures that could prove cost effective in reducing vehicular emissions for the Denver area. The basic experiments involved idle inspection and maintenance, mandatory engine maintenance, high altitude engine adjustment, sea level retrofit, high altitude retrofit, and engine deterioration.

PB-255 563/9GA PC$6.00/MF$3.00
Olson Labs., Inc., Anaheim, Calif.
High Altitude Vehicular Emission Control Program. Volume V. Development of Techniques, Criteria, and Standards to Implement a Vehicle Inspection, Maintenance and Modification Program.
Final rept.
Dec 73, 232p
Sponsored in part by Colorado State Dept. of Public Health, Denver. Prepared in cooperation with Environmental Protection Agency, Denver, Colo. Region VIII., TRW, Inc., McLean, Va. Transportation and Environmental Operations, and Automotive Testing Labs., Inc., Aurora, Colo.

Also available in set of 7 reports as PB-255 558-SET, PC$42.25/MF$9.75.

Descriptors: *Motor vehicles, *Exhaust emissions, *Air pollution abatement, Project planning, Inspection, Altitude, Maintenance, Surveys, Safety, Cost analysis, Public opinion, Methodology, Legislation, Standards, Traffic control, Colorado, Automobiles, Criteria.
Identifiers: Motor idle data, *Denver(Colorado), Modification, Retrofitting, Air pollution standards, Motor vehicle inspection, Motor vehicle maintenance, Mandatory motor vehicle maintenance.

This volume of the report evaluates the factors that would affect the integration of the proposed vehicle emission inspection program with the existing vehicle safety inspection program. The analysis considers only light-duty, passenger vehicles and excludes motorcycles, trucks, busses, and trailers which currently also are safety inspected. Included in the results are federal and Colorado vehicle safety inspection procedures, estimated task times, and an approximate inspection fee. An estimate of vehicle idle emission inspection also is provided in terms of task time and approximate fee.

PB-255 564/7GA PC$13.75/MF$3.00
Automotive Testing Labs., Inc., Aurora, Colo.
High Altitude Vehicular Emission Control Program. Volume VI. The Data Base.
Final rept.
Jun 75, 600p
Sponsored in part by Colorado State Dept. of Public Health, Denver. Prepared in cooperation with Environmental Protection Agency, Denver, Colo. Region VIII. TRW, Inc., McLean, Va. Transportation and Environmental Operations.
Also available in set of 7 reports as PB-255 558-SET, PC$42.25/MF$9.75.

Descriptors: *Motor vehicle engines, *Exhaust emissions, *Data acquisition, Projects, Colorado, Tests, Altitude, Regional geography, Statistical samples, Automobiles, Methodology, Carbon monoxide, Nitrogen oxides, Hydrocarbons, Information retrieval.
Identifiers: Motor idle data, *Denver(Colorado), High altitude areas, Data bases, Motor vehicle inspection, Motor vehicle maintenance.

The data base outlined in this volume is the result of a vehicle emissions test program conducted in the high altitude environment of the Denver, Colorado area during the period from August, 1973 to November, 1974. The test program, designed to investigate several emission control strategies within the state of Colorado. A sample of 300 light duty vehicles, selected to duplicate as closely as possible Colorado registration distributions by make and model year, was assembled. Data were obtained in several categories for carbon monoxide and nitrogen oxides. The results appear in tabular form.

PB-255 565/4GA PC$4.50/MF$3.00
Automotive Testing Labs., Inc., Aurora, Colo.
High Altitude Vehicular Emission Control Program. Volume VII. Experimental Characterization of Vehicular Emission and Engine Deterioration.
Final rept.
Jul 74, 71p
Contract EPA-C-280528, Grant EPA-C-280528
Sponsored in part by Colorado State Dept. of Public Health, Denver. Prepared in cooperation with TRW, Inc., McLean, Va. Transportation and Environmental Operations.
Also available in set of 7 reports as PB-255 558-SET, PC$42.25/MF$9.75.

Descriptors: *Motor vehicle engines, *Exhaust emissions, *Wear, Altitude, Regional geography, Automobile engines, Deterioration, Colorado, Tests, Statistical samples, Project planning, Evaluation, Data processing, Experimental data, Maintenance, Inspection, Air pollution abatement.
Identifiers: Test vehicles, High altitude areas, *Denver(Colorado), Alternatives, Motor vehicle inspection, Motor vehicle maintenance.

Volume 7 deals with the findings from the first six months of the high altitude program with regard to engine deterioration, noting that an expanded experimental program may be required for full evaluation, and indicating the benefits from mandatory inspection and maintenance.

PB-255 569/8GA PC$4.00/MF$3.00
Environmental Protection Agency, Denver, Colo. Technical Support Branch.
Longmont Wastewater Treatment Facility, Longmont, Colorado.
Technical assistance project, Mar-May 72.
May 72, 30p SA/TSB-2

Descriptors: *Sewage treatment, *South Platte River, Site surveys, Waste water, Performance evaluation, Water quality, Technical assistance, Laboratories, Biochemical oxygen demand, Design, Colorado.
Identifiers: Sewage treatment plants, Longmont(Colorado).

The purpose of the report is to summarize the results and findings of the technical assistance project that was conducted at the Longmont, Colorado, waste water treatment facility. The initial objective to improve the plant's operations and the effluent quality was successful to a degree and is documented in this report.

PB-255 573/8GA PC$4.00/MF$3.00
Environmental Protection Agency, Denver, Colo. Technical Support Branch.
Fort Collins Wastewater Treatment Facility, Fort Collins, Colorado.
Technical assistance project, Jan-Feb 73.
May 73, 30p SA/TSB-22

Descriptors: *Sewage treatment, *Activated sludge process, *Cache La Poudre River, Site surveys, Waste water, Performance evaluation, Design, Technical assistance, Dissolved gases, Oxygen, Turbidity, Maintenance, Aeration, Colorado.
Identifiers: *Sewage treatment plants, Fort Collins(Colorado), Dissolved oxygen.

On October 25, 1972, personnel from the Environmental Protection Agency, Region VIII, and from the Colorado State Department of Health conducted an operation and maintenance survey of the Fort Collins Wastewater Treatment Plant No. 2 (activated sludge plant). The data collected during this study showed that the Fort Collins plant generally was producing a good quality effluent. The purpose of the report is to document the results from the technical assistance project.

PB-255 574/6GA PC$11.75/MF$3.00
Utah Dept. of Social Services, Salt Lake City. Bureau of Water Quality.
Utah Lake - Jordan River Hydrologic Basins Water Quality Management Planning Study. Volume I.
Final rept.
Jun 75, 433p
Prepared by Templeton, Linke and Alsup, Salt Lake City, Utah, and Engineering-Science, Inc., Berkeley, Calif. See also Volume 2, PB-255 575.

Descriptors: *Water quality management, *Utah Lake, *Jordan River, Climate, Hydrogeology, Groundwater, Population(Statistics), Land use, Sewage treatment, Industrial waste treatment, Economic analysis, Waste disposal, Environmental impacts, Financing, Water consumption, Water resources, Water pollution abatement, Legislation, Tables(Data), Utah.
Identifiers: Water utilization, Water quality standards.

Contents:
The natural environment;
Population, land use and economy;
Existing wastewater collection, treatment and disposal facilities;
Financial arrangements for wastewater collection, treatment and disposal;
Water use and waste loads;
Water resources development;
Water quality standards and control strategies;
Present water quality;
Waste disposal and water quality;
Evaluation procedures;
Water quality management alternatives;
The recommended plan.

PB-255 575/3GA PC$5.00/MF$3.00
Utah Dept. of Social Services, Salt Lake City. Bureau of Water Quality.
Utah Lake - Jordan River Hydrologic Basins Water Quality Management Planning Study. Volume II. Appendix.
Jun 75, 88p
Prepared by Templeton, Linke and Alsup, Salt Lake City, Utah, and Engineering-Science, Inc., Berkeley, Calif. See also Volume 1, PB-255 574.

Descriptors: *Water quality management, *Utah Lake, *Jordan River, Tables(Data), Inventories, Maps, Water quality, Mathematical models, Evaluation, Maps.

The report is an appendix to the Utah Lake, Jordan River hydrologic basins water quality management study. It includes tables, inventories, figures, and maps.

PB-255 578/7GA PC$4.00/MF$3.00
Environmental Protection Agency, Denver, Colo. Div. of Air and Water Programs.
Evaluation of the Wyoming Water Supply Program.
Summary rept.
Dec 72, 31p
See also PB-255 579.

Descriptors: *Water pollution, *Water supply, *Wyoming, Research projects, Surveys, Evaluation, Water quality, Standards, Bacteria, Chemical properties, Sewage treatment, Industrial waste treatment, Recommendations.

Contents:
Water supplies in Wyoming;
Purpose of evaluation;
Water supplies studied;
Program evaluation.

PB-255 579/5GA PC$8.00/MF$3.00
Environmental Protection Agency, Denver, Colo. Div. of Air and Water Programs.
Evaluation of the Wyoming Water Supply Program.
Dec 72, 238p
See also Summary, PB-255 578.

Descriptors: *Water pollution, *Water supply, *Wyoming, Surveys, Bacteria, Chemical properties, Sewage treatment, Industrial waste treatment, Legislation, Public health, Budgeting, Manpower.
Identifiers: *Water quality data, Campbell County(Wyoming), Lincoln County(Wyoming), Natrona County(Wyoming), Water quality standards.

Approximately 246,000 people in Wyoming are served by 107 public water supplies. In-depth studies of the public, semi-public, and individual water supplies were conducted in Campbell, Lincoln, and Natrona Counties. These counties were selected because each had different types of water sources and surveillance. A total of 23 public, 13 semi-public, and 127 individual supplies were surveyed in the three counties. Bacteriological and chemi-

cal qualities of the supplies were judged on the basis of the 1962 U. S. Public Health Service Drinking Water Standards.

PB-255 584/5GA PC$4.00/MF$3.00
National Enforcement Investigations Center, Denver, Colo.
Sediment Studies in Back River Estuary, Baltimore, Maryland.
Apr 76, 41p EPA/330/2-76/021
Prepared in cooperation with Environmental Protection Agency, Philadelphia, Pa. Region III.

Descriptors: *Water pollution, *Back River Estuary, Sediments, Oxygen, Sludge, Concentration(Composition), Inorganic nitrates, Inorganic phosphates, Dissolved oxygen, Correlation techniques, Sampling, Nutrients, Proposals, Water quality abatement, Tables(Data), Maryland.
Identifiers: *Water quality data, Organic loading, Dissolved oxygen.

The report is an investigation of the Back River Estuary located in Maryland. The study objectives were: Determine in-situ sediment oxygen demand rates of the surficial bottom deposits; determine the general distribution and approximate depth of organic sludge deposits; compare the sediment oxygen demand of surficial to underlying sediments; determine existing nutrient concentrations of surficial and subsurface sediments; evaluate the Maryland Water Resource Authority engineering proposals for improving the water quality of the Back River Estuary.

PB-255 585/2GA PC$5.50/MF$3.00
National Enforcement Investigations Center, Denver, Colo.
Characterization and Evaluation of Wastewater Sources United States Steel Corporation, National Plant, Pittsburgh, Pennsylvania, February 3-6, 1975.
May 76, 113p EPA/330/2-76/026
Prepared in cooperation with Environmental Protection Agency, Philadelphia, Pa. Region III.

Descriptors: *Industrial wastes, *Water pollution, *Steel plants, *Monongahela River, Concentration(Composition), Effluents, Outfall sewers, Organic compounds, Phenols, Oils, Greases, Trace elements, Metals, Zinc, Cyanides, Pen.
Identifiers: *Water quality data, Oil wastes, Pittsburgh(Pennsylvania), United States Steel Corporation, National Steel Plant.

The National Steel Plant and the Duquesne Steel Plant are operated under a single management unit known as the National-Duquesne Works. The National Plant is located on the Monongahela River at McKeesport, Pa., immediately upstream of and across the river from the Duquesne Plant. Process water is pumped from the Monongahela River and is supplemented with treated water purchased from the City of McKeesport. Wastewater is discharged from outfalls 001-010. All wasteloads discharged from outfalls 002-010 are computed on a net basis.

PB-255 586/9GA PC$5.00/MF$3.00
National Enforcement Investigations Center, Denver, Colo.
Characterization and Evaluation of Wastewater Sources United States Steel Corporation, Clairton Works, Pittsburgh, Pennsylvania, January 28-31, 1975.
May 76, 136p EPA-330/2-76/025
Prepared in cooperation with Environmental Protection Agency, Philadelphia, Pa. Region III.

Descriptors: *Industrial wastes, *Water pollution, *Steel plants, *Monongahela River, Concentration(Composition), Effluents, Outfall sewers, Organic compounds, Phenols, Oils, Greases, Trace elements, Metals, Zinc, Cyanides, Pennsylvania.
Identifiers: *Water quality data, Oil wastes, United States Steel Corporation, Pittsburgh(Pennsylvania), Coking, Clairton Works.

The United States Steel Corporation (USSC) Clairton Works consists of a coke plant, chemical plant and steel plant. The facility is in the city of Clairton on the Monongahela River, about 29 km (18 mi) upstream of the confluence of the Ohio, Monongahela and Allegheny Rivers. The major activity at Clairton is the coking of coal and subsequent recovery of chemicals. The steel plant incudes a blast furnace for either basic iron or ferromanganese (FeMn) production and four steel finishing mills. Wastewater is discharged daily into the Monongahela River through outfalls 001, 002, 003, 013, 014, 015, 115, 016, 017 and 018. The remaining outfalls (i.e., 004, 005, 006, 007, 008, 010, 011, 012 and 020) discharge into Peters Creek, a tributary of the Monongahela River. A dye study was conducted on outfalls 003, 004, 008 and 020 by NEIC personnel December 15-18, 1975 to determine if the USSC sampling locations are representative. In-plant monitoring was conducted during January 28-31, 1976. This report summarizes the survey results.

PB-255 588/6GA PC$4.50/MF$3.00
National Enforcement Investigations Center, Denver, Colo.
Characterization and Evaluation of Wastewater Sources United States Steel Corporation, Irvin Plant, Pittsburgh, Pennsylvania, August 18-28, 1975.
Dec 75, 70p EPA/330/2-75/012
Prepared in cooperation with Environmental Protection Agency, Philadelphia, Pa. Region III.

Descriptors: *Industrial wastes, *Water pollution, *Steel plants, *Monongahela River, Concentration(Composition), Effluents, Outfall sewers, Organic compounds, Phenols, Oils, Greases, Trace elements, Metals, Zinc, Cyanides, Pennsylvania.
Identifiers: *Water quality data, Oil wastes, United States Steel Corporation, Pittsburgh(Pennsylvania), Irvin Plant.

The Irvin Plant, which commenced operation in 1938, is primarily a steel finishing operation. A portion receives treatment, consisting of coagulation and sand filtration in the old and new (No. 1 and No. 3) water treatment facilities. Wastewater is discharged from two outfalls (005 and 006) to the Monongahela River. An acid neutralization treatment facility, a waste oil treatment facility and a domestic wastewater treatment facility are located at the Irvin Plant. Waste oil treatment effluent is discharged through outfall 005 and domestic effluent through outfall 006. Wastes from the acid neutralization treatment facility are hauled by railroad tank car to an approved dump for disposal. The Environmental Protection Agency, Region III, requested the National Enforcement Investigations Center (NEIC) to conduct an intensive survey of the U. S. Steel Works in the Pittsburgh area to characterize and evaluate existing wastewater discharges.

PB-255 589/4GA PC$4.50/MF$3.00
National Enforcement Investigations Center, Denver, Colo.
Characterization and Evaluation of Wastewater Sources United States Steel Corporation, Edgar Thomson Plant, Pittsburgh, Pennsylvania, July 22-August 5, 1975.
Dec 75, 75p EPA/330/2-75/011
Prepared in cooperation with Environmental Protection Agency, Philadelphia, Pa. Region III.

Descriptors: *Industrial wastes, *Water pollution, *Steel plants, *Monongahela River, Concentration(Composition), Effluents, Outfall sewers, Organic compounds, Phenols, Oils, Greases, Trace elements, Metals, Zinc, Cyanides, Pennsylvania.
Identifiers: *Water quality data, Oil wastes, United States Steel Corporation, Pittsburgh(Pennsylvania), Edgar Thomas Plant.

The United States Steel Corporation (USSC) Edgar Thomson (ET) Plant is a basic steel production facility producing steel ingots which in turn are rolled into slabs. The majority of these slabs are conveyed by rail to the Irvin Plant where they are converted into various finished steel and tin products. The ET Plant consists of a sintering plant, five blast furnaces (BF), two basic oxygen furnaces, a 44-inch slab mill and an ingot mold foundry. Two intake stations on the Monongahela River supply the facility with up to 795,000 cu m/day (210 mgd) of water with only a small portion of this water being treated. The plant discharges wastewater from five outfalls (001, 002, 003, 004 and 010) which, with the exception of 001, discharge into the Monongahela River. Outfall 001 discharges to Turtle Creek, a tributary of the Monongahela River. In-plant monitoring was conducted during the period July 22 to August 5, 1975. This report discusses the findings of the survey and compares the loads discharged during the above period with the waste load limitations proposed by the USSC in their amended adjudicatory hearing request of March 3, 1975.

PB-255 591/0GA PC$5.00/MF$3.00
National Field Investigations Center-Denver, Colo.
Remote Sensing Report, Lake Ontario. A Study of Thermal Discharges from Ginna Nuclear Power Station, Oswego Steam Power Station, and Nine Mile Point Nuclear Power Station.
Apr 75, 88p EPA/330/3-75/002

Descriptors: *Water quality, *Lake Ontario, *Thermal pollution, Water pollution, Electric power plants, Temperature distribution, Thermodynamics, New York, Remote sensing, Spaceborne photography, Maps, Data.
Identifiers: Ginna nuclear power plant, Oswego steam power plant, Nine Mile Point nuclear power plant, Pultneyville(New York), Oswego(New York), Scriba(New York).

An airborne remote sensing study of thermal discharges into Lake Ontario, from powerplants on its southeast shore was conducted. Thermal infrared imagery of the lakeshore in the vicinity of the three existing plants was obtained with the thermal channel of an internally calibrated multispectral scanner mounted in a research aircraft. During each flight, water temperatures were measured at the three powerplants by ground crews. The airborne imagery and water temperature data were used to characterize the recorded thermal fields or plumes. Color illustrations reproduced in black and white.

PB-255 592/8GA PC$7.75/MF$3.00
National Field Investigations Center-Denver, Colo.
Remote Sensing Report, Baltimore Harbor and Wicomico River Basin, Maryland.
Mar 74, 208p

Descriptors: *Water pollution, *Monitors, *Remote sensing, *Wicomico River Basin, Maryland, Aerial reconnaissance, Sources, Infrared detectors, Industrial wastes, Oil pollution, Algae, Fluid flow, Ecology, Water quality.
Identifiers: *Water pollution detection, Baltimore(Maryland), ERTS-1 satellite, *Baltimore Harbor.

An aerial remote sensing study of Baltimore Harbor and the Wicomico River Basin was conducted on 9 May 1973. This investigation was undertaken at the request of the Department of Natural Resources, State of Maryland. The purpose of the Baltimore Harbor study was to

document the presence of discharges of wastewater to the Harbor from municipal and industrial sources, storm drains, and other unidentifiable sources. Photographic and thermal infrared data were recorded during the day and thermal infrared data were recorded at night using sensors mounted in high performance reconnaissance aircraft. No ground truth was collected. All observed discharges were compared to known municipal and industrial wastewater discharges to identify locations of potential sources that had not filed for waste discharge permits. In addition, the relative magnitude, color, dispersion behavior and, in some cases, relative levels of concentrations of the detected discharges and resulting plumes were documented.

PB-255 593/6GA PC$5.00/MF$3.00
National Enforcement Investigations Center, Denver, Colo.
Characterization and Evaluation of Wastewater Sources United States Steel Corporation, Homestead Wheel and Axle Plant, McKees Rocks, Pennsylvania, August 21-28, 1975.
Jan 76, 77p EPA/330/2-76/019
Prepared in cooperation with Environmental Protection Agency, Philadelphia, Pa. Region III.

Descriptors: *Industrial wastes, *Water pollution, *Steel plants, *Monongahela River, Concentration(Composition), Effluents, Outfall sewers, Organic compounds, Phenols, Oils, Greases, Trace elements, Metals, Zinc, Cyanides, Pennsylvania.
Identifiers: *Water quality data, Oil wastes, United States Steel Corporation, McKees Rocks(Pennsylvania), Homestead Wheel and Axle Plant.

The United States Steel Corporation (USSC) Homestead Works consists of three separate areas. The Carrie Furnace area and the Main Homestead area are on the Monongahela River, about 14.5 km (9 mi) upstream of the confluence of the Ohio, Monongahela and Allegheny Rivers. The Wheel and Axle works is on the Ohio River at McKees Rocks, Pennsylvania, about 4.8 km (3 mi) downstream from the confluence of the three rivers. The McKees Rocks plant consists of the older manufacturing area containing the permitted discharges, and the newer area containing mostly dry operations. Wastewaters are discharged through three outfalls: 018, 019 and 020. All three outfalls discharge to the Graham Street storm sewer which flows into the Ohio River, about 0.8 km (0.5 mi) east of the plant property. On June 12, 1975, NEIC was requested to assist Region III in investigating specific USSC discharges. A reconnaissance of the Homestead Works including the Wheel and Axle plant was conducted on July 23, 1975.

PB-255 594/4GA PC$6.00/MF$3.00
National Enforcement Investigations Center, Denver, Colo.
Characterization and Evaluation of Wastewater Sources United States Steel Corporation, Duquesne Plant, Pittsburgh, Pennsylvania, February 26-Mar 6, 1976.
May 76, 142p EPA/330/2-76/024
Prepared in cooperation with Environmental Protection Agency, Philadelphia, Pa. Region III.

Descriptors: *Industrial wastes, *Water pollution, *Steel plants, *Monongahela River, Concentration(Composition), Effluents, Outfall sewers, Organic compounds, Phenols, Oils, Greases, Trace elements, Metals, Zinc, Cyanides, Pennsylvania.
Identifiers: *Water quality data, Oil wastes, United States Steel Corporation, Pittsburgh(Pennsylvania), Duquesne Plant.

The United States Steel Corporation (USSC) National-Duquesne Works is composed of two separate plants, the National Plant and the Duquesne Plant on the east and west banks, respectively, of the Monongahela River. The plants are about 8 km (13 mi) upstream of the confluence of the Allegheny and Monongahela Rivers at Pittsburgh, Pennsylvania. The Duquesne Plant is primarily an iron and steel production facility with some finishing operations. Ancillary facilities include an oxygen plant, granulated slag operation and water treatment plant. Wastewater is discharged through seven major outfalls (011, 012, 013, 014, 015, 016 and 017) and four intermediate outfalls (111, 211, 112 and 114). All wastewaters are discharged untreated with the exception of process wastes from the blast furnaces, BOF, primary mills and bar mill. Blast furnace and BOF process wastewaters are treated for solids removal by gravity thickening and vacuum filtration of sludge. Scale pits are installed for the removal of mill scale from primary and bar mill wastewaters. U.S. EPA Region III, Philadelphia, Pennsylvania, requested the National Enforcement Investigations Center (NEIC) to conduct an intensive survey of wastewater discharges to the Monongahela River from U.S. Steel Corporation facilities.

PB-255 595/1GA PC$5.00/MF$3.00
National Enforcement Investigations Center, Denver, Colo.
Water Quality Study, St. Andrew Bay, Florida.
Jun 75, 96p EPA/330/2-75/003
Prepared in cooperation with Environmental Protection Agency, Atlanta, Ga. Region IV.

Descriptors: *Water quality, *Saint Andrew Bay, Water pollution, Waste water, Industrial wastes, Aquatic microbiology, Coliform bacteria, Water analysis, Chemical analysis, Sewage, Remote sensing, Spaceborne photography, Fisheries, Lagoons(Ponds), Estuaries, Florida, Mexico Gulf.
Identifiers: Panama City(Florida).

Objectives of the joint bacteriological, water quality and remote sensing investigations of the estuarine waters of St. Andrew and East Bays were as follows: (1) Define dispersion characteristics of the discharge of International Paper Company wastewaters from the Bay County Wastewater Treatment Plant (aerated lagoon) and determine the extent to which this discharge is dispersed into the East Bay by tidal action; (2) Assess the chemical and bacteriological quality of the waters overlying shellfish beds in East Bay to determine if violations of water quality standards are occurring; (3) Through correlation of observed wastewater dispersion patterns and bacterial levels, evaluate the contribution of International Paper Company to the observed water quality problems; and (4) Determine the distribution of commercially harvestable shellfish in East Bay and estimate the economic impact of closure of shellfish areas to harvesting.

PB-255 596/9GA PC$4.00/MF$3.00
National Field Investigations Center-Denver, Colo.
Evaluation of Proposed NPDES Permit Limitations for Homestake Mining Company and Lead-Deadwood Sanitary District Number 1.
Feb 75, 28p EPA/330/2-75/002

Descriptors: *Water pollution abatement, *Licenses, *Mine waters, *Sewage treatment, *Whitewood Creek, *Spearfish Creek, Bioassay, Concentration(Composition), Cyanides, Toxicity, Fisheries, Chlorine, Survival, Water quality, Cheyenne River, Waste water, South Dakota.

An evaluation was conducted to determine wastewater permit limitations under the National Pollutant Discharge Elimination System (NPDES) for the Homestake Mining Company in South Dakota. EPA also determined whether the Lead-Deadwood Sanitary District could handle the Company wastewater effluent. Fish bioassay tests were conducted on wastewater effluents from both facilities. Analyses of bioassay results and supporting chemical data led to the conclusion that cyanide was the principal toxic agent. In order to establish a cold water fishery of Whitewood creek (the receiving stream), it was concluded that the total cyanide concentration should not exceed 0.005 mg/l, and that effluents containing cyanide should not be combined with any wastewaters containing residual chlorine.

PB-255 599/3GA PC$6.75/MF$3.00
National Field Investigations Center-Denver, Colo.
Remote Sensing Report, Pacific Northwest Area, Washington, Oregon, Idaho. April and July 1973.
Sep 74, 156p
Prepared in cooperation with Environmental Protection Agency, Seattle, Wash. Region X.

Descriptors: *Water quality, Water pollution, Remote sensing, Spaceborne photography, Maps, Mapping, Washington(State), Oregon, Idaho, Puget Sound, Grays Harbor, Willamette River, Coeur D'Alene Lake, Snake River, Salmon River.
Identifiers: *Pacific Northwest Region(United States).

Airborne remote sensing studies of five areas in the Pacific Northwest states of Washington, Oregon and Idaho (Puget Sound, Wash.; Grays Harbor, Wash.; Willamette River, Oreg.; Coeur D'Alene Lake, Idaho; and the Snake and Salmon Rivers, Idaho) were conducted in April and July 1973. Aircraft sensors were selected to record the presence and characteristics of municipal and industrial wastewater discharges. The location and characteristics of detected discharges were compared with those of known discharges reported in Refuse Act Permit Program (RAPP) and National Pollutant Discharge Elimination System (NPDES) permit applications. Discharges from unknown sources that may have originated from nonfilers, and apparent additional or changed discharges at sources filing for permits were identified. The color, dispersion pattern and size of visible plumes for the observed discharges were documented. Color illustrations reproduced in black and white.

PB-255 600/9GA PC$5.50/MF$3.00
National Field Investigations Center-Denver, Colo.
Evaluation of ITT Rayonier, Inc., Outfall Port Angeles Harbor, Washington.
Dec 74, 105p EPA/330/3-74/001

Descriptors: *Water quality, *Port Angeles Harbor, Water pollution, Sewage, Waste water, Diffusion, Ocean currents, Water flow, Tidal currents, Spent sulfite liquors, Paper industry, Industrial water, Outfall sewers, Juan de Fuca Strait, Remote sensing, Spaceborne photography, Washington(State), Industries.
Identifiers: Tracer studies, ITT Rayonier, Incorporated.

The ITT Rayonier, Inc. pulp and paper mill has five outfalls along the Port Angeles Harbor shore with effluents consisting mostly of process and cooling water. The mill has a submerged (extended) outfall which discharges an ammonia-base hot caustic extract and bleach plant effluent. The outfall also discharges 20 percent of the plant's total ammonia-base spent sulfite liquor (SSL) wasteload. This report documents the dilution or dispersion characteristics of the diffuser effluent as a function of various tide conditions.

PB-255 601/7GA PC$3.50/MF$3.00
Environmental Protection Agency, Denver, Colo. Technical Support Branch.

Upper Eagle Valley Sanitation District Wastewater Treatment Facility, Avon, Colorado.
Technical assistance project, Mar-Apr 73.
Jun 73, 23p SA/TSB-23

Descriptors: *Sewage treatment, *Eagle River, *Gore Creek, Site surveys, Waste water, Performance evaluation, Technical assistance, Design, Recommendations, Colorado.
Identifiers: *Sewage treatment plants, Avon(Colorado).

On September 14, 1972, Region VIII of the Environmental Protection Agency (EPA), received a letter from the Colorado Department of Health requesting operational assistance at the Upper Eagle Valley Sanitation District Wastewater Treatment Facility. An on-site evaluation survey of the facility was conducted by EPA on October 26 and 27, 1972 and a formal technical assistance project was initiated on March 19, 1973. This report outlines the findings and results of the technical assistance project and proposes several recommendations for future consideration at the Upper Eagle treatment plant.

PB-255 604/1GA PC$4.00/MF$3.00
Environmental Protection Agency, Denver, Colo. Technical Investigations Branch.
Impact of the Schwartzwalder Mine on the Water Quality of Ralston Creek, Ralston Reservoir, and Upper Long Lake.
Mar 72, 40p SA/TIB-25

Descriptors: *Water quality, *Upper Long Lake, *Radioactive contaminants, Uranium ore deposits, Radioactivity, Sediments, Water pollution, Radium isotopes, Uranium, Colorado.
Identifiers: Schwartzwalder Mine, *Ralston reservoir, Ralston creek, Radium 226.

Considering the magnitude of radioactivity concentrations in Ralston Creek and use of the stream as a primary water source for two water supply reservoirs - Ralston Reservoir and Upper Long Lake, Region VIII initiated a limiting monitoring effort to supplement the State/Water Board program. This monitoring activity extended over the period of May through September, 1972. Emphasis was placed on eliminating critical data voids; i.e., radioactivity concentrations in the waters of Ralston Reservoir and Upper Long Lake. In addition to the grab water samples collected from these impoundments, sample collection included the mine effluent, water and bottom sediment samples from Ralston Creek and Long Lake ditch, and bottom sediment samples from the two impoundments.

PB-255 620/7GA PC$4.00/MF$3.00
ENSCO, Inc., Springfield, Va. Transportation and Instrumentation Sciences Div.
Establishment of Interim Guidelines for Bridge Rails Required to Contain Heavy Vehicles. Volume I. Statement of Criteria.
Final rept. Jul 73-Nov 74,
J. A. Bloom, T. J. Rudd, and J. J. Labra. Nov 74, 46p FHWA/RD-75-45
Contract DOT-FH-11-8147
See also PB-255 621.

Descriptors: *Highway bridges, *Barriers, *Traffic safety, *Structural engineering, Guidelines, Passenger vehicles, Trucks, Buses(Vehicles), Design criteria, Dynamic tests, Structural forms, Flexibility, Rigidity.

The work described involves the development of interim guidelines for the design of high performance bridge rails which would safely contain all vehicles in the range from subcompacts (2250 lb.) right through heavy vehicles (40,000 lb.) under specified impact conditions. The report is in three volumes, Volume 1 Statement of Criteria, Volume 2 Technical Approach, and Volume 3 Appendices to Technical Approach. A fourth volume is currently in preparation which describes a computer program (modified BARRIER VII) which will allow highway engineers to check tentative bridge rail design against the guidelines. In Volume 1 the guidelines for both flexible and rigid barriers are concisely explained and examples of their application given.

PB-255 621/5GA PC$8.00/MF$3.00
ENSCO, Inc., Springfield, Va. Transportation and Instrumentation Sciences Div.
Establishment of Interim Guidelines for Bridge Rails Required to Contain Heavy Vehicles. Volume 2. Technical Approach.
Final rept. Jul 73-Dec 74,
J. A. Bloom, T. J. Rudd, and J. J. Labra. Dec 74, 237p FHWA/RD-75-46
Contract DOT-FH-11-8147
See also PB-255 620.

Descriptors: *Highway bridges, *Barriers, *Structural engineering, *Traffic safety, Guidelines, Design criteria, Computerized simulation, Impacts, Equations of motion, Structural forms, Flexibility, Rigidity, Loads(Forces), Algorithms.

The work described in this report (Volumes 1, 2, and 3) involves the development of interim guidelines for the design of high performance bridge rails which would safely contain all vehicles in the range from subcompacts (2250 lb.) right through heavy vehicles (40,000 lb.) under specified impact conditions. The report is in three volumes. In Volume 2 the computer simulation approach used to derive the guidelines is described. Portions of this document are not fully legible.

PB-255 634/8GA PC$6.60/MF$3.00
Transportation Research Board, Washington, D.C.
Pavement Design, Performance, and Rehabilitation,
R. K. Kher. 1976, 162p* TRB/TRR-572, ISBN-0-309-02485-4

Descriptors: *Flexible pavements, *Concrete pavements, Performance, Design, Pavement bases, Soil mechanics, Loads(Forces), Thermal stresses, Winter.

This record deals with design, performance, and rehabilitation of both concrete and asphalt pavements. The papers should be of interest to design engineers and those involved in pavement research. A significant development in recent years has been the application of systems concepts of pavement design and management. Pavement design and management systems consist of coordinated sets of activities or subsystems that should produce an optimum design strategy for a given set of circumstances. These systems may include subsystems for inputs, such as traffic and materials properties, for structural thickness selection, and for selection of an optimal design strategy including possible future rehabilitation activities. Three papers in this record deal with fairly complete subsystems. Others deal with certain phases of the many activities involved.

PB-255 635/5GA PC$2.20/MF$3.00
Transportation Research Board, Washington, D.C.
Utility Facilities in Transportation Corridors,
G. W. Bradley. 1976, 50p* TRB/TRR-571, ISBN-0-309-02484-6

Descriptors: *Transportation, *Public utilities, Pipeline transportation, Refineries, Petroleum refining, Urban areas, Underground facilities, Trenching, Coordination, Waste water, Waste treatment, Urban planning, Public works.

The papers in this Record deal with (a) the concept of an energy corridor to establish a precedent for the orderly, controlled transmission of sources of all types of energy from supplier to user; (b) the state of the art of common trenching of utilities; (c) an examination of the increasing complexities involved in providing essential utility and transportation services; (d) a discussion of wastewater recycling along transportation corridors; (e) a highlighting of the severity and complexity of the utility-pole accident problem and a recommendation for further specific actions.

PB-255 637/1GA PC$2.60/MF$3.00
Transportation Research Board, Washington, D.C.
Planning and Programming for Transportation,
William T. Mikolowsky. 1976, 62p* TRB/TRR-574, ISBN-0-309-03488-9

Descriptors: *Urban transportation, Policies, Fuel economy, Urban planning, Community development, Linear programming, Rural areas, Highways, California, South Vietnam, Benefit cost analysis, Transportation management, Transportation models.
Identifiers: Transit fares, Saigon(South Vietnam), Los Angeles(California).

The papers in this Record include (a) an analysis of near-term transportation alternatives for the Los Angeles region that uses the policy-oriented urban transportation model developed by the Rand Corporation; (b) a presentation of some of the long-range transportation planning alternatives for Saigon and some of the problems associated with applying the U.S. Department of Transportation planning packages in a remote location; (c) a description of a new interactive programming system for transportation planning; (d) a discussion of the development of a procedure for using the goal-programming technique, a modification and extension of linear programming, to evaluate urban transit systems for meeting the transportation-related goals of a community; and (e) a discussion of how the linear-programming formulation is a valuable extension of current methods of cost-benefit analysis for highway improvements.

PB-255 678/5GA PC$4.50/MF$3.00
Oklahoma Univ., Norman. Bureau of Water Resources Research.
The Evaluation of Water and Related Land Resource Projects: A Procedural Test,
George W. Reid, and William R. Southard. 1969, 52p
Prepared in cooperation with Water Resources Council, Washington, D.C.

Descriptors: *Water resources, *Land use, *Project planning, Watersheds, Objectives, Water quality, Income, Water supply, Benefit cost analysis, Evaluation, Flood control, Arkansas.
Identifiers: *Poteau River Watershed project.

The Water Resources Council has developed a set of procedures to be used in the evaluation of water and related land resource projects. These procedures, presented in 1969, represent a major substantive change in the concept of resource development evaluation. The Council contracted with several federal agencies and universities to test the new procedures prior to their implementation. The Poteau River Watershed Project was selected as the test vehicle. The Poteau Project is a joint Soil Conservation Service-Local Flood Control, Municipal Water Supply, and Recreational Project located in West Central Arkansas.

PB-255 681/9GA PC$4.00/MF$3.00
Michigan Univ., Ann Arbor. Highway Safety Research Inst.

Response of Vehicles to Pavement Undulations.
Final rept.,
Thomas M. Post, and James E. Bernard. Mar 76, 44p UM-HSRI-76-6, FHWA/SES-76-07

Descriptors: *Pavements, *Passenger vehicles, *Speed control, Computerized simulation, Acceleration, Deflection, Loads(Forces), Tires, Dynamic response, Traffic safety.

The ride response of two passenger vehicles to long configuration, large amplitude pavement undulations was simulated with a computer model. Passenger accelerations, spring deflections, tire forces, and ground clearances were estimated at speeds up to 60 m.p.h. Two pavement undulation configurations were tested: A 12-foot by 5-inch parabolic design which had been favorably reported in earlier British research and a 16-foot by 6-inch design which was an attempt to improve on the British design. The study concludes that the 16-foot by 6-inch configuration is not acceptable because the Buick station wagon would have zero ground clearance at 15 to 20 m.p.h. and the Mustang at 30 to 50 m.p.h. This would not occur at any speed for the 12 by 5-inch undulation. A trial installation, possibly of lesser amplitude, should be monitored over some length of time before pavement undulations are recommended as a widespread speed control device.

PB-255 686/8GA PC$8.00/MF$3.00
Illinois Inst. for Environmental Quality, Chicago.
Economic Impact Study of the Proposed Motor Vehicle (In-Use) Noise Regulations.
Final rept.,
Sheldon J. Plager, Peter Loquercio, Roger W. Findley, John S. Moore, and Marvin Frankel.
May 76, 239p* IIEQ-76-10
Report of the Task Force on Noise.

Descriptors: *Noise reduction, *Motor vehicles, *Benefit cost analysis, *Illinois, Economic impact, Standards, Regulations, Cost estimates, Automobiles, Trucks, Motorcycles, Local government, Prices, Industries, Agriculture, Taxes, Economic development.
Identifiers: Noise abatement, Noise standards.

The study, prepared pursuant to Illinois Public Act 79-790, examines economic impacts expected to result from the establishment of proposed noise standards applicable to motor vehicles in use in Illinois. The study assesses the costs of the standards as applied to the several vehicles classes (heavy, medium, and light trucks, automobiles and motorcyles), and the impact of these cost on state and local government, and on Illinois agriculture. The potential effects on prices, employment, and industrial activity are also considered. The last section of the study reviews the anticipated benefits from noise abatement expected to be achieved by the proposed standards, provides a measure of those benefits, and compares benefits with costs on an overall basis and, for certain vehicle classes, on an incremental basis. The method for determining the amount of noise reduction expected from each of the vehicle classes is described.

PB-255 695/9GA PC$9.00/MF$3.00
Little (Arthur D.), Inc., Cambridge, Mass.
Study of the Feasibility of Federal Procurement of Fuels Produced from Solid Wastes.
Final rept.
Jul 75, 256p EPA-SW-123c
Contract EPA-68-01-2951

Descriptors: *Solid waste disposal, *Fuels, *Boilers, Government policies, National government, Economic analysis, Electric power plants, Refuse disposal, Shredding, Separation, Operating costs, Capitalized costs, Inventories, Site surveys, Plant location, Tables(Data), Reclamation, Classification.

The study determines in which cases and under what circumstances it is feasible for Federally owned boilers to use solid waste as a supplementary fuel. The study provides the data necessary to write a guideline to aid operators of Federally owned boilers in modifying their systems to use solid waste as a supplementary fuel. The study examines industrial sized boilers, the modifications necessary, the solid waste preparation required, and system economics.

PB-255 699/1GA PC$5.50/MF$3.00
Environmental Technology Assessment, Inc., Oak Brook, Ill.
The Air Quality and Economic Implications of Supplementary Control Systems in Illinois.
Final rept.,
Jay E. Norco, and Roger K. Raufer. Nov 75, 122p IIEQ-75/22

Descriptors: *Air pollution abatement, *Illinois, *Sulfur dioxide, Atmospheric composition, Economic impact, Measurement, Fuels, Systems engineering, Coal, Models, Data processing, Sources, Illinois, Regulations, Methodology, Electric power plants, Fuel substitution.
Identifiers: *Supplementary air pollution abatement, Air pollution standards, *Air quality maintenance, Low sulfur coal.

The Illinois Pollution Control Board completed a series of inquiry hearings into the sulfur dioxide regulations and, subsequently, asked the Illinois Institute for Environmental Quality to investigate supplementary control systems (SCS) as an air pollution control strategy. This document reports on a study conducted to evaluate the impact of SCS in Illinois. The purpose of this investigation was to assess the possible impact on Illinois of supplementary control systems as a strategy for attaining air quality standards with minimum economic impact while, at the same time, conserving low sulfur fuels and maintaining the viability of the Illinois coal mining industry. The study is directed toward using this system with electric power plants.

PB-255 743/7GA PC$4.50/MF$3.00
Texas Transportation Inst., College Station.
Benefit-Cost Analysis: Updated Unit Costs and Procedures.
Research rept.,
Jesse L. Buffington, and William F. McFarland.
May 76, 73p TTI-2-18-75-202-2

Descriptors: *Freeways, *Vehicular traffic control, *Benefit cost analysis, *Texas, Urban areas, Utilization, Highways, Automobiles, Cost estimates, Fuel shortages, Motor vehicle accidents, Air pollution, Noise pollution.

Various freeway surveillance and traffic control projects can be implemented on Texas freeways to accomplish desired goals. In order to decide which project should be implemented, a practical and reliable analytical procedure which considers all measurable impacts must be developed and applied. Also, accurate and up-to-date data must be available for use in such a determination. The data contained in this report should partially meet the above needs. The report contains highway user costs that are based on 1975 conditions in the urban areas of Texas. The unit costs reported here are vehicle running cost, travel time costs, and accident costs. Also, data on air and noise pollution, as well as other highway impact data, are included. The report contains an analysis of the impact of the energy shortage on the relative costs that are used in the conventional benefit-cost or cost-effectiveness analyses.

PB-255 748/6GA PC$7.75/MF$3.00
Texas Transportation Inst., College Station.
Tentative Pavement and Geometric Design Criteria for Minimizing Hydroplaning.
Final rept. on Phase I,
B. M. Gallaway, D. L. Ivey, H. E. Ross, Jr., W. B. Ledbetter, and D. L. Woods. Feb 75, 211p
FHWA/RD-75-11
Contract DOT-FH-11-8269

Descriptors: *Automobile tires, *Pavements, *Rainfall, Interactions, Reviews, Design criteria, Experimental data, Models, Data acquisition, Tests, Reduction, Drainage, Surface properties, Skid resistance, Motor vehicle accidents, Steering, Highways, Recommendations, Treads, Velocity, Attrition.
Identifiers: *Hydroplaning, Tire pavement interactions, Skid resistance trailers, Spin down, Spin down trailers.

A comprehensive literature review, multi-state questionnaires, mathematical modeling, computer simulations, field testing and data correlations were used to establish tentative criteria relating to geometric and pavement surface texture and cross slope to minimize highway hydroplaning. The authors have covered in detail the empirical indications of hydroplaning as determined from interpretation of hard data developed with a spin down trailer in a hydroplaning trough, skid number trailers including drag link and torque and extensive tire and pavement testing under simulated rain. Precise measurements of surface drainage were examined and equations relating pavement texture and cross slope and rainfall density were developed. Random and patterned textures covering the complete range of real world pavements were included. Vehicle control as related to variation in cross slope was simulated. A summary of tentative criteria to reduce hydroplaning is presented along with recommendations for construction of flexible and rigid pavements to minimize hydroplaning.

PB-255 769/2GA PC$5.50/MF$3.00
Camp, Dresser and McKee, Inc., Boston, Mass.
Municipal Wastewater Treatment Plant Sludge and Liquid Sidestreams.
Final rept.,
Anton A. Kalinske. Jun 76, 123p* EPA/430/9-76/007
Contract EPA-68-01-0324

Descriptors: *Sewage treatment, *Sludge disposal, *Water pollution control, *Cost effectiveness, Sludge drying, Industrial wastes, Thickening, Sand filtration, Laboratory tests, Reclamation, Materials recovery, Management planning, Sludge digestion.
Identifiers: Secondary sewage treatment.

The purpose of this report is to provide background information on the handling and disposal of sludges and liquid sidestreams produced in municipal wastewater treatment works. The intent of this report is to provide design engineers the information needed to arrive at environmentally sound and cost-effective methods of sludge handling and disposal. The term 'sludge', for the purpose of this study, includes all solid and semisolid wastes and suspensions of solids resulting from the operation of wastewater treatment facilities. The sludges produced can be entirely organic in nature, inorganic, or a combination of both, depending on the treatment processes employed in removing the suspended, colloidal, and dissolved pollutants from the wastewater. The handling, treatment, and eventual disposal of the various sludges and process liquid sidestreams can create some difficult technical problems involving appreciable costs. It is noted that sludges and sidestreams are an integral part of the entire wastewater treatment operation. It is not possible to optimize the design of wastewater treatment works to ensure the required effluent quality, for the least capital investment and operating cost, without considering the sludge and sidestream han-

dling and disposal methods as integral with the other processes. Portions of this document are not fully legible.

PB-255 818/7GA PC$12.00/MF$3.00
Office of Water Research and Technology, Washington, D.C. Water Resources Scientific Information Center.
Water Reuse, A Bibliography. Volume 5.
Jul 76, 467p* OWRT/WRSIC-76/204, W76-10818
See also Volume 4, PB-241 172.

Descriptors: *Water reclamation, *Bibliographies, Sewage treatment, Industrial wastes, Water treatment, Water conservation, Irrigation, Desalting, Potable water, Water quality management, Water pollution, Municipalities.
Identifiers: *Water reuse, Recycling, Reclaimed water, Recirculated water.

This report, containing 301 abstracts, is another in a series of planned bibliographies in water resources produced from the information base comprising SELECTED WATER RESOURCES ABSTRACTS (SWRA). Volumes 1 through 4 cover the material announced in SWRA from October 1968 through January 1972 (see W75-06639, W75-06638, W73-11702 and W73-11701). At the time of search for this bibliography, the data base had 95,781 abstracts covering SWRA through April 15, 1976 (Volume 9, Number 8). Author and subject indexes are included.

PB-255 834/4GA PC$5.50/MF$3.00
Washington Univ., Seattle.
Water Pollution Control Act of 1972. Study of Effluent Charges.
Final rept.,
Gardner M. Brown, Jr., Allen V. Kneese, Susan Rose-Ackerman, and Otto A. Davis. Jun 76, 113p* NCWQ-75/112
Prepared in cooperation with New Mexico Univ., Albuquerque, Yale Univ., New Haven, Conn., and Carnegie-Mellon Univ., Pittsburgh, Pa.

Descriptors: *Water pollution abatement, *Expenses, *Economic analysis, Taxes, Water quality, Assessments, Water law, Public law, Comparison, Payment, Policies.
Identifiers: *Federal Water Pollution Control Act Amendments of 1972.

The National Commission on Water Quality invited three distinguished economists to examine the issue of effluent charges as a policy mechanism for a national pollution control program. Effluent charges are required payments for the use of waste disposing powers of the Nation's waters. Prof. Allen V. Kneese, U. of New Mexico, presents the economic arguments which form the basis for assessing the desirability of this approach and outlines how a system of effluent charges might work. Prof. Susan Rose-Ackerman, Yale U., outlines a more market-like alternative and critically reviews Kneese's proposals. Prof. Gardner M. Brown, Jr., U. of Washington, discusses effluent charges, 'focusing on the cons.' He also summarizes European experiences with such charges. All three papers are reviewed in an essay by Prof. Otto A. Davis, Carnegie-Mellon U., who examines the agreements and disagreements between the authors. Prof. Davis concludes that there is a strong and persuasive case for effluent charges as a device for improving ambient water quality and that this alternative merits serious consideration in the years ahead, especially as we near the satisfaction of the 1977 interim requirements.

PB-255 840/1GA PC$5.50/MF$3.00
Tennessee Valley Authority, Knoxville.
Trial Application of Revised Evaluation Procedures at Kingsport, Tennessee.
Mar 70, 110p

Descriptors: *Water resources, *Land development, *Community development, Projects, Evaluation, Tennessee, Methodology, Floods, Flood plains, Revisions, Regional planning, Surveys, Demography, Land use, Safety, Public utilities, Benefit cost analysis, Recommendations, Financing, Economic factors.
Identifiers: *Kingsport(Tennessee), Alternatives.

This report describes a trial application of the revised evaluation procedures for water and related land resource projects presented by the Special Task Force of the Water Resources Council.

PB-255 846/8GA PC$4.50/MF$3.00
Texas Transportation Inst., College Station.
Design and Evaluation of Freeway Surveillance and Traffic Control Systems.
Final rept. Sep 74-May 76,
William R. McCasland. May 76, 70p TTI-2-18-75-202-3F
Prepared in cooperation with Federal Highway Administration, Washington, D.C.

Descriptors: *Urban transportation, *Freeways, *Vehicular traffic control, Design, Effectiveness, Traffic safety, Overpasses, Research, Texas.
Identifiers: Traffic surveillance.

Studies of urban traffic operations were conducted on the freeways of Texas to determine the design and effectiveness of traffic control and surveillance systems; to relieve peak period congestion; to lessen the impact of disabled vehicles on the operation and safety of the freeways; and reduce the incidents of overhead structure damage by overheight vehicles. The research study uses demonstration installations to test the implementation requirements as well as to evaluate the operational theory.

PB-255 898/9GA PC$6.00/MF$3.00
American Public Transit Association, Washington, D.C.
Proceedings of the Urban Mass Transportation Administration/American Public Transit Association Research and Development Priorities Conference Held at Arlington, Va. on February 19-20, 1976.
Conference proceedings.
May 76, 131p UMTA-DC-06-0136-76-1

Descriptors: *Urban transportation, *Mass transportation, *Meetings, Buses(Vehicles), Rail transportation, Automation, Urban sociology, Transportation management.
Identifiers: Public transportation, Paratransit.

The document contains the material that was presented at the Urban Mass Transportation Administration/American Public Transit Association Research and Development Priorities Conference. The papers specifically address the following aspects of urban transportation research and development: bus and paratransit technology; rail transit technology; new systems and automation; socioeconomic research and special projects; service and methods demonstrations; priorities and balance in UMTA research and development; delivery systems for putting results of research and development into service; transit management; and planning methodology.

PB-255 911/0GA PC$3.60/MF$3.00
Transportation Research Board, Washington, D.C.
Transportation and Land Use Planning Abroad.
Special rept.,
Floyd I. Thiel, Teruki Kitamura, Yasumasa Torii, Allan K. Sloan, and Daniel L'Huillier. 1976, 83p* TRB/SR-168, ISBN-0-309-02487-0

Descriptors: *Transportation, *Land use, *Foreign countries, Noise reduction, Noise pollution, Financing, Public opinion, Pedestrians, Highway transportation, Urban transportation, Cargo transportation, Japan, Canada, Europe, Middle East, Developing countries, Metropolitan areas.

The papers discuss some of the ways that transportation and land use planning abroad is providing experience that can be helpful in the United States. Geographic areas from which experience is drawn include Japan, Canada, Europe, and the Middle East. Topics include noise and other transportation impacts, land use techniques to deal with these impacts, transit financing, public participation, 'pedestrianization' in various countries, pricing to restrain parking, truck regulation, highway needs in Canada, and transportation sensitivity considerations in developing countries.

PB-255 921/9GA PC$5.50/MF$3.00
Multisystems, Inc., Cambridge, Mass.
Operational Implications of a Major Modal Diversion to Transit - A Macro-Analysis.
Final rept.,
James H. Batchelder, Larry S. Englisher, Brian C. Kullman, and Kenneth L. Sobel. Apr 76, 124p* DOT/TST-76/72
Contract DOT-OS-50266

Descriptors: *Urban transportation, Travel patterns, Services, Cost estimates, Transportation models, Travel demand, Regional planning.
Identifiers: Public transportation, Dial a ride systems, Paratransit, Exclusive bus lanes, Transit riders.

The study examined the implications of dramatic increases in transit patronage on system structure and performance. Models were developed to examine the cost and service attributes of a variety of system components, including express bus, exclusive lane operation, subscription service, dial-a-ride, and several route-based feeder options. These models were applied in a regional context over a range of patronage assumptions to evaluate both the individual components and the effects resulting from various service combinations. The analysis provided insights into the structure of integrated transit systems and the expansion of these systems to serve increasing shares of urban travel.

PB-256 092/8GA PC$7.50/MF$3.00
North Carolina State Univ., Raleigh. Dept. of Zoology.
Nutrients in the Neuse River Estuary.
Sea Grant pub.,
John E. Hobbie, and Nathaniel W. Smith. Dec 75, 190p UNC-SG-75-21, NOAA-76052606
Grant NOAA-04-3-158-40

Descriptors: *Stream pollution, *Estuaries, *Aquatic biology, *Neuse River, Water analysis, Salinity, Bacteria, Concentration(Composition), Algae, Surface temperature, Fresh water, Inorganic phosphates, Inorganic nitrates, Oxygen, Graphs(Charts), Tables(Data), North Carolina.
Identifiers: Sea Grant program, *Eutrophication.

The report is the first detailed study of the chemistry and biology of one estuary of the Neuse River. The research reported gives basic information on the nutrient concentrations and the algal populations in the Neuse River Estuary from 1970 to 1973.

13C. Construction Equipment Materials, and Supplies

AD-A027 279/9GA PC$4.50/MF$3.00
Cold Regions Research and Engineering Lab Hanover N H

Mechanics of Cutting and Boring. Part 2: Kinematics of Axial Rotation Machines,
Malcolm Mellor. Jun 76, 56p Rept no. CRREL-76-16
See also Part 1, AD-A010 634.

Descriptors: *Cutting tools, *Drilling machines, Rock, Rates, Kinematics, Earth penetrating devices, Excavation, Permafrost, Cutting, Earth handling equipment, Tunnels, Tunneling, Augers.

This report, which is one of a series on the mechanics of cutting and boring in rock, deals with the kinematics of machines such as rotary drills, augers, tunnel boring machines, corers, and raise borers, in which the rotary cutting unit revolves about an axis that is parallel to the machine's direction of advance. The discussion and analysis cover the geometry and motion of various components of the cutting system, including such topics as tool trajectories, tool speeds, motions of the more complicated mechanisms, chipping depth, penetration rates, production and clearance of cuttings, tool angles, and spatial distribution of cutters. Worked examples are given to illustrate the application of various equations to practical problems. (Author)

AD-A027 383/9GA PC$4.00/MF$3.00
Construction Engineering Research Lab (Army) Champaign Ill
Review of the Weldability of Construction Materials.
Interim rept.,
R. A. Weber, and C. E. Jackson. Jun 76, 27p Rept no. CERL-IR-M-168

Descriptors: *Structural steel, *Weldability, Construction materials, State of the art.

The report reviews the concept of weldability of construction materials. Metallurgical and mechanical properties influenced by welding are discussed, as are the effects of welding variables such as heat input, nugget area, and cooling rate. An experimental procedure is proposed to document significant welding parameter ranges. The results of the experimental procedure will provide a data base for other research on the nondestructive testing of field welds.

AD-A027 408/4GA PC$3.50/MF$3.00
Cold Regions Research and Engineering Lab Hanover N H
Thermal Insulation Using Plastic Foam (Varmeisolering med Karbamidskumplast),
W. Tobiasson, and A. Greatorex. Jul 76, 15p Rept no. CRREL-TL-533
Trans. from Statens Institute for Byggnadsforskning, 4 1963-1964.

Descriptors: *Thermal insulation, *Expanded plastics, *Construction materials, *Thermosetting plastics, Foam, Energy conservation, Urea, Formaldehyde, Sweden, Translations.

Urea foam has in the past few years come into use for improving the thermal insulation in older buildings, as well as in new buildings with faulty insulation. A significant improvement of the insulation in these types of buildings is obtained by injection of plastic foam. The experience is so far rather limited in Sweden. The greatest advantage with this method is that no major re-work is required in the parts of the building which are insulated. Urea foam is manufactured from urea, formaldehyde, foaming agents and a hardener. Manufacture of slab or blocks can be performed in a factory, or the ingredients can be mixed at the construction site and be injected by means of special equipment, into the part of the structure which is to be insulated. The curing takes place inside the structure after the material has been injected. The final product is a thermo-setting plastic, which, among other things, means that its hardness is virtually independent of temperature. (Author)

PB-255 322/0GA PC$4.00/MF$3.00
Washington State Dept. of Highways, Olympia. Bridge Condition Section.
Investigation of Bridge Deck Deterioration Caused by De-Icing Chemicals.
Research program rept. (Final),
Gary F. Damich. May 75, 49p RPR-20.1
Sponsored in part by Federal Highway Administration, Washington, D.C.

Descriptors: *Bridge decks, *Deicers, *Corrosion, *Deterioration, Reinforced concrete, Reinforcing steels, Spalling, Wear, Delaminating, Chlorides, Tests.

Forty-eight bridge decks were investigated for deterioration using visual, mechanical, electrical and chemical techniques. Data from the various techniques and the techniques themselves were compared and evaluated. Of the thirty-seven bridges for which all four types of inspection could be accomplished, twenty-nine were deteriorating as evidenced by delaminated concrete, and only two had nondeteriorating scores for all four techniques. None of the investigative techniques used in the project have been shown able to predict deck deterioration problems six to eight years in advance, the desired time period for project planning. The mechanical technique, commonly referred to as the 'chain drag', is the method recommended for continued use by bridge inspection crews.

13D. Containers and Packaging

AD-A027 176/7GA PC$3.50/MF$3.00
Air Force Packaging Evaluation Agency Wright-Patterson AFB Ohio
Test and Evaluation of Proposed Fiberglass Reinforced Plastic (FRP) Shipping and Storage Container for Nested External Aircraft Fuel Tanks (370 Gallon).
Engineering and test data rept. Dec 75-Apr 76,
Prisciliano Quijas. Jun 76, 17p Rept no. DSPD-76-23

Descriptors: External stores, *Fuel tanks, Fiber reinforced composites, Fiberglass, *Shipping containers, Containers, Storage, Test and Evaluation, Handling, Shock resistance.
Identifiers: *Aircraft equipment.

Testing and evaluation was performed as requested by ASD/4950/SUP on a proposed fiberglass reinforced plastic container for shipping and storage of nested 370 gallon external aircraft fuel tanks.

13F. Ground Transportation Equipment

AD-A027 202/1GA PC$3.50/MF$3.00
Army Test and Evaluation Command Aberdeen Proving Ground Md
Drawbar Pull.
Final rept. on test operations procedure.
19 Nov 75, 11p Rept no. TOP-2-2-604
Supersedes rept. no. MTP-2-2-604, dated 4 Aug 65, AD-717 999.

Descriptors: *Tracked vehicles, *Test methods, Trafficability, Acceleration, Towing, Fuel consumption, Climbing, Mobility, Trottling, Amphibious vehicles, Roads, Field tests, Terrain.
Identifiers: Common engineering test procedures, Wheeled vehicles, Drawbar pull tests.

The report describes procedures for evaluating vehicle power available for acceleration, towing, or hill climbing; it defines drawbar pull, includes procedures for hard-surface, soil, and water tests, and discusses vehicle preparation, instrumentation, method of computing results, data reduction and presentation. The report established curves for comparing performance with similar vehicles and for predicting gradeability, and is applicable to wheeled, tracked, and amphibious vehicles.

NTIS/PS-76/0642/9GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Motor Vehicle Tires: Skid and Wear Resistance; Nondestructive Tests, Safety (Citations from the NTIS Data Base).
Rept. for 1964-Jul 76,
Guy E. Habercom, Jr. Aug 76, 166p*
Supersedes NTIS/PS-75/533, and COM-74-11372. See also NTIS/PS-76/0643.

Descriptors: *Bibliographies, *Automobile tires, *Skid resistance, *Wear resistance, *Nondestructive tests, Tire treads, Tire wear, Wear tests, Safety, Abstracts.

Skid resistance and wear qualities of vehicle tires are investigated in these Government-sponsored research reports. Nondestructive test methods are evaluated, as well as the extent of compliance with Federal Safety Standards of foreign and domestic tires. (This updated bibliography contains 161 abstracts, 22 of which are new entries to the previous edition.)

NTIS/PS-76/0643/7GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Motor Vehicle Tires: Skid and Wear Resistance; Nondestructive Tests; Safety (Citations from the Engineering Index Data Base).
Rept. for 1970-Jul 76,
Guy E. Habercom, Jr. Aug 76, 76p*
See also NTIS/PS-76/0642.

Descriptors: *Bibliographies, *Automobile tires, *Skid resistance, *Wear resistance, *Nondestructive tests, Tire treads, Tire wear, Wear tests, Safety, Abstracts.

Skid resistance and wear qualities of vehicle tires are investigated in these reports from a worldwide literature survey. Nondestructive test methods are evaluated. (Contains 69 abstracts)

PB-255 835/1GA PC$6.75/MF$3.00
Southern California Association of Governments, Los Angeles.
Rail Transit Car Costs. A Review, Analysis and Projections.
Technical rept.
May 75, 165p UMTA-CA-09-0035-75-1

Descriptors: *Rapid transit railways, *Electric vehicles, *Cost estimates, Forecasting, Railroad cars, Urban transportation, Street railroads, Market research, Urban planning, California.
Identifiers: Los Angeles(California), Commuter rail systems.

The report provides those involved in transportation planning in Southern California with some essential background data for the planning efforts for rail transit in this region. It attempts to forecast car costs for rapid transit, commuter rail, and light rail planning activities of SCAG and the multi-agency effort relative to rapid transit planning in the Los Angeles Basin. The report covers rail vehicles ordered over the last 12-13 years. The operational characteristics of each of the rail systems are discussed. This includes headways, speeds, power, etc., as well as a tabulation of the equipment used by each

operator and a summarization of system characteristics. The division of the rail car market by manufacturer is examined. Also compared are the expenditures made for each of commuter rail, rapid transit and light rail transit by City, by Transit Operator and by Type of Equipment including a further breakdown for locomotive-hauled cars versus electrically-propelled cars.

PB-255 888/0GA PC$4.50/MF$3.00
Muesser, Rutledge, Wentworth and Johnston, New York.
Subsurface Investigation, Section F003, Branch Route.
Rept. no. 8,
14 Jul 76, 56p MRWJ-76-148
Sponsored in part by Washington Metropolitan Area Transit Authority, D.C.

Descriptors: *Subway railways, *District of Columbia, *Routes, *Subsurface investigations, Foundations, Rock mechanics, Tunneling(Excavation), Subsurface structures, Borings, Metropolitan areas, Maryland, Virginia.
Identifiers: Foundation engineering, *M street.

Results are summarized of thirteen supplementary borings made at the location of sewer crossings on M street in southeast Washington, District of Columbia and at selected locations within the Washington Naval Shipyard. The borings were performed to investigate conditions at the planned crossing of the subway tunnels beneath the M Street sewers and to ascertain the character of deep bearing strata for high-load underpinning piles to be installed within the Navy Yard. The report contains geological sections incorporating the new borings, logs of these borings, results of laboratory tests on soil samples obtained and a discussion of anticipated design and construction problems. This investigation is for the Washington Area Metro System.

PB-255 953/2GA PC$7.50/MF$3.00
Ohio State Univ., Columbus. Transportation Control Lab.
Fundamental Studies in the Automatic Longitudinal Control of Vehicles.
Final rept.,
Robert E. Fenton, Karl W. Olson, Robert J. Mayhan, Gerald M. Takasaki, and Patrick M. Chu. Jul 75, 198p RF-3944A-1-1, DOT/TST-76/79
Contract DOT-OS-40100
Prepared in cooperation with Federal Highway Administration, Washington, D.C.

Descriptors: *Urban transportation, *Vehicles, *Automatic control, Spacing, Safety, Automation, Speed control, Traffic control, Mathematical models, Dynamics, Electric drives, Telecommunication, Monitors, Doppler radar, Position(Location).
Identifiers: Personal rapid transit, Dual mode transportation systems, Ride quality.

The achievement of safe and efficient longitudinal control is probably the most significant technical problem associated with individual-vehicle transport systems such as PRT, dual-mode, and the automatic highway. The accomplishments over the first year of a two-year study include: (a) the development of a technique, which involves the use of discrete elements embedded in the guideway, for measuring vehicle position; (b) the development of an approach employing audio frequencies and helically wound transmission lines for providing continuous position reference information, to a string of moving vehicles; (c) the partial development of a promising technique for the accurate measurement of instantaneous velocity; (d) the development of a validated model for a vehicle's propulsion system dynamics; and (e) the design and testing of a vehicle controller which provides excellent tracking and a comfortable ride under all normal control conditions.

13G. Hydraulic and Pneumatic Equipment

AD-A027 242/7GA PC$7.50/MF$3.00
Naval Postgraduate School Monterey Calif
Microprogrammable Data Acquisition and Probe Control System (MIDAS IV) with Application to Compressor Testing.
Master's thesis,
Dennis Delane Patton. Mar 76, 180p

Descriptors: *Data acquisition, *Microprocessors, *Probes, *Test equipment, *Compressors, Turbomachinery, Remote control, Pneumatic devices, Switches, Analog systems, Recording systems, Computer programs, Theses, Calculators.
Identifiers: MIDAS 4 system, Probe control systems, HP-9830A computers.

The construction and use of a programmable, fully automatic data acquisition and control system (MIDAS 4) is reported with application to probe surveys in a turbomachine. The MIDAS 4 system was designed to record up to 48 channels of analog data, position and align a pneumatic probe in the direction of flow in surveys across a flow passage, and control the operation of up to four Scanivalve pneumatic switches. The MIDAS 4 input and output is presently via a teletypewriter keyboard and paper-tape punch. A direct interface with the Hewlett-Packard HP 9830A calculator is a logical modification of the system. (Author)

AD-A027 583/4GA PC$7.50/MF$3.00
Mcdonnell Douglas Astronautics Co Titusville Fla
Fluidic Laminar Angular Rate Sensor Research Program.
Final rept.,
George W. Roe. Nov 75, 178p L0318, HDL-CR-75-020-1
Contract DAAG39-75-C-0020

Descriptors: *Flueric devices, *Fluidics, Gas flow, Fluid amplifiers, Laminar flow, Jet flow, Test equipment, Orifices.
Identifiers: LARS(Laminar angular rate sensor), *Laminar angular rate sensor, Free jets, Null shift.

A program was conducted to design, build and test a series of laminar angular rate sensors (LARS), operating on gas, to determine the performance effect of various geometric parameters. The concept of flow source supply, positive pressure control ports and vent isolation from atmosphere were evaluated. Performance of the optimized LARS is compared to a baseline device. A feasibility model of a dual axis LARS was developed. (Author)

AD-A027 587/5GA PC$4.50/MF$3.00
Harry Diamond Labs Adelphi Md
Fluerics 38. A Computer-Aided Design Analysis for the Static and Dynamic Port Characteristics of Laminar Proportional Amplifiers.
Technical rept.,
Tadeusz M. Drzewiecki. Jun 76, 63p Rept no. HDL-TR-1758
See also report dated Aug 74, AD-A012 165.

Descriptors: *Fluid amplifiers, *Laminar flow, Computer aided design, Equations, Computer programs, Flueric devices, Numerical analysis, Static tests, Dynamic tests.
Identifiers: Proportional amplifiers, Amplifier port characteristics.

This paper presents, in a computer program form, an analysis of laminar proportional amplifiers (LPA's). The equations have been programmed for a 16K-core minicomputer with typewriter graphics capability. Results of the numerical computations for the amplifier port characteristics are presented on a single sheet of computer output in both tabular and graphical form. Tabulated data represented the input characteristic, the output characteristic, the self-staged operating conditions and gain, and the blocked gain. Graphical outputs are the input and output characteristics. Typical calculations are presented for standard types of amplifier configurations.

AD-A027 769/9GA PC$5.00/MF$3.00
General Dynamics/Convair San Diego Calif
Digital Program for Computing the Transfer Function and Frequency Response of the Fluidgenics Regulator (CCD-PROG-024).
C. A. Roth. 30 Mar 66, 78p GDC-DDE66-014, SAMSO-TR-76-173
Contract AF 04(695)-379

Descriptors: *Digital simulation, *Fluidic control, Computer programs, Transfer functions, Frequency response, Pressure regulators, Flow charting.
Identifiers: Fluidgenics pressure regulators.

The Fluidgenics Pressure Regulator Program was developed to evaluate the linearized, steady-state transfer function associated with the Fluidgenics pressure regulators used on the ATLAS LAUNCH VEHICLES. The regulator analysis was made in conjunction with the 5 cps longitudinal oscillation stability analysis. The important quantities generated by the program are the steady-state gains, damping ratios, and break frequencies for the transfer function; the transfer function in equation form, and the magnitudes and phase angles as a function of input frequency.

13H. Industrial Processes

AD-A027 464/7GA PC$4.00/MF$3.00
Massachusetts Inst of Tech Cambridge Dept of Materials Science and Engineering
Machine Casting of Ferrous Alloys.
Interim rept. no. 4, 1 Jul-31 Dec 75,
M. C. Flemings, K. P. Young, and R. G. Riek.
May 76, 29p AMMRC-CTR-76-15
Contract DAAG46-73-C-0110, ARPA Order-2267
See also report dated Oct 75, AD-A018 679.

Descriptors: *Die casting, Stainless steel, Copper alloys.
Identifiers: Rheocasting, *Thixocasting, Steel 304, Steel 440, Copper alloy 905, Solidification.

Major emphasis was on the development of the Thixocasting process. The Continuous Rheocaster was modified to improve performance and a Softness Indicator was developed to control the Thixocasting reheating stage, thereby eliminating thermocouples. Following production of more than 1000 pounds of the model Copper Alloy 905, more than 800 pounds of AISI 440C and 304 stainless steel was Rheocast in ingot form. Charges, cut from these ingots, were used to produce more than 500 Thixocastings in the copper alloy and over 400 stainless steel Thixocastings. In the course of the work, casting parameter optimization has shown that good Thixocasting practice for these alloys requires equivalent or lower casting pressures than conventional liquid practice and considerably lower metal ingate velocities.

AD-A027 644/4GA PC$4.00/MF$3.00
Construction Engineering Research Lab (Army) Champaign Ill
Development of a Weld Quality Monitor.
Interim rept.,
R. Weber, F. Kearney, and S. Joshi. Jul 76, 26p Rept no. CERL-IR-M-183

Report on Nondestructive Testing for Field Welds.

Descriptors: *Monitors, *Nondestructive testing, *Welding, Welds, Quality control, Gas metal arc welding, Monitoring, Real time.

A weld monitoring system has been developed based on conditioning the primary signals from the welding machine and comparing them with preset limits. A light is activated when a welding parameter such as voltage, current, or heat input is outside the control limits. The circuitry has been tested with simulated primary signals. The voltage channel has also been tested using primary signals from an automatic gas metal-arc welding machine.

AD-A027 745/9GA PC$3.50/MF$3.00
Massachusetts Inst of Tech Cambridge Dept of Electrical Engineering
Strong Electron Emission from Patterned Tin-Indium Oxide Thin Films,
M. Hartwell, and C. G. Fonstad. 1975, 4p
AFOSR-TR-76-0786
Grant AF-AFOSR-2493-73
Availability: Pub. in Technical Digest, International Electron Devices Meeting, IEEE, p519-521 1975.

Descriptors: *Electron emission, *Thin films, Oxides, Photolithography, Sputtering, Reprints.
Identifiers: Tin indium oxide.

Strong electron emission is reported from patterned thin films of tin-indium oxide and preliminary studies of this phenomenon are presented. The pattern, etched in the sputtered films using standard photolithographic techniques, is an 'H' or 'dumbbell' shape with a narrow crossbar. With crossbars o.1 mm wide, in excess of 1.5 mA of emission current is typically seen with a current of 15 mA through the sample and 300 V on a collector 2 cm from the sample. The emitters are physically rugged and are not damaged by operation in a vacuum as poor as 10 to the -5th power Torr. (Author)

13I. Machinery and Tools

AD-A027 156/9GA PC$3.50/MF$3.00
Royal Aircraft Establishment Farnborough (England)
The Investigation and Selection of Parameters for Harmonic Drives with a Disc Wave Generator (Issledovanie i Vybor Parametrov Volnovykh Zubchatykh Peredach s Diskovym Generatorom Voln),
D. P. Volkov, and A. F. Krainev. 20 Feb 76, 18p
RAE-Library Trans-1680, DRIC-BR-52719
Trans. of World Congress on the Theory of Machines and Mechanisms, (4th) Session 2B (USSR), Paper 20 p103-108 1975, by J. W. T. Palmer.

Descriptors: *Cams, *Vibrators(Mechanical), Harmonic generators, Splines, Disks, Drives, Manufacturing, Bearings, Shafts(Machine elements), Buildings, Selection, Translations, USSR.
Identifiers: *Disk wave generators, *Harmonic drives.

The results are given of investigations into, and recommendations are made for selection of, the basic parameters of harmonic drives with disc wave generators, having diameters of flex splines between 250 and 730mm, a transmission ratio between 100 and 365 in one mechanism and calculated torsional moments between 5 and 100kN m. (Author)

AD-A027 435/7GA PC$4.50/MF$3.00
Woods Hole Oceanographic Institution Mass
Potential Design Alternatives and Analysis of System Response Variables, Characteristic of Undersea Manipulators with Force Feedback.
Technical memo. Nov 74-Nov 75,
W. R. Bertsche, A. J. Pesch, and C. L. Winget.
May 76, 69p Rept no. WHOI-TM-1-76
Contract N00014-74-C-0179

Descriptors: *Manipulators, *Underwater tools, Systems engineering, Response, Performance(Human), Operators(Personnel), Feedback, Actuators, Experimental design, Assessment, Servovalves.
Identifiers: Force feedback control.

This report concerns the examination of the engineering features which affect force feedback design and fidelity in undersea manipulators. The findings obtained from the test program provided the basis on which a series of engineering test procedures were established for use in evaluation undersea manipulators, including a set of basic definitions concerning each of the variables being measured. (Author)

AD-A027 436/5GA PC$4.00/MF$3.00
Woods Hole Oceanographic Institution Mass
Description of an Experimental Undersea Manipulator System with Force Feedback.
Technical memo. Nov 74-Nov 75,
W. R. Bertsche, A. J. Pesch, and C. L. Winget.
May 76, 31p Rept no. WHOI-TM-2-76
Contract N00014-74-C-0179

Descriptors: *Manipulators, *Underwater tools, Remote control, Electronic equipment, Performance(Human), Operators(Personnel), Submersibles, Feedback, Simulators, Servovalves, Hydraulic equipment.
Identifiers: Force feedback control.

The report describes an experimental undersea manipulator system with force feedback capability. The basic system includes the means for providing alternate forms of force feedback: information to the operator, with the installation designed to simulate the undersea operating conditions of a small manned submersible. (Author)

AD-A027 700/4GA PC$5.00/MF$3.00
Rhode Island Univ Kingston Div of Engineering Research and Development
Performance Evaluation of Ceramic Materials and Aspects of Surface Preparation for Gas-Bearings.
Final technical rept. 1 Sep 74-30 Aug 75,
Thomas J. Rockett, Peter J. Gielisse, O. B. Damani, K. Kulkarni, and P. W. Smith. Dec 75, 99p Rept no. 98-04-4046C
Contract N00014-75-C-0226
Prepared in cooperation with the Admiralty Compass Observatory, Slough (England).

Descriptors: *Gas bearings, *Ceramic materials, Boron carbides, Silicon nitrides, Alumina, Oxides, Cobalt alloys, Tungsten carbides, Friction, Coefficients, Wear, Electron microscopy, Electronic scanners, Preparation, High temperature, Surface roughness, Surface properties, Computerized simulation.

In the first part of this report, silicon nitride and boron carbide were the materials studied for their friction and wear properties. Boron carbide in air gave an average coefficient of friction of 0.11 + or - 0.1 but values as low as 0.03 were observed under certain conditions. Surface chemistry plays a critical role in determining the coefficient values. Wear yielded surface-active debris which became more dense to form packed surface layers. The behavior of these surface layers determines the coefficient of friction. Silicon nitride yielded more wear debris and gave very short stable runs. Packed surface layers were also observed. Coefficients of friction from 0.4 to 0.04 were measured. The most frequently observed value in air was 0.28. In a separate work (Part II) an in-depth study of the surface preparation for gas bearings was done. Surface finish, which results from a complex interaction between system and material, has a very important influence on the performance of the gas bearings.

N76-25563/7GA PC$5.00/MF$3.00
Mississippi State Univ., Mississippi State. Dept. of Mechanical Engineering.
Amplitude Effects on the Dynamic Performance of a Hydrostatic Gas Thrust Bearing.
Annual Report, Jan. - Dec. 1975.
A. K. Stiffler, and R. R. Tapia. Dec 75, 90p NASA-CR-148173, MSSU-EIRS-ME-76-1
Contract NGR-25-001-050

Descriptors: Amplitude distribution analysis, *Gas bearings, *Hydrostatics, Reynolds equation, Damping, Finite difference theory, Fourier series, Mathematical models, Thrust bearings.

For abstract, see STAR 1416

N76-25564/5GA PC$4.00/MF$3.00
Mississippi State Univ., Mississippi State. Dept. of Mechanical Engineering.
Studies on the Dynamic Characteristics of Gas Film Bearings and Dampers.
Final Report, Jan. 1973 - Dec. 1975.
A. K. Stiffler. Dec 75, 27p NASA-CR-148174, MSSU-EIRS-ME-76-2
Contract NGR-25-001-050

Descriptors: *Dynamic characteristics, *Gas bearings, Rotors, Damping, Film thickness, Pressure distribution, Stiffness matrix.

For abstract, see STAR 1416

PATENT-3 986 590 Not available NTIS
Department of the Interior, Washington, D.C.
Magnetic Ore Separater.
Patent,
Roger W. Boom, Yehia M. Eyssa, and John Sutton. Filed 20 Sep 74, patented 29 Jun 76, 10p PB-255 379/0, PAT-APPL-508 013
Supersedes PB-243 952.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Magnetic separators, *Patents, Minerals, Beneficiation, Magnetic fields, Slurries.
Identifiers: PAT-CL-209-39.

The invention relates to magnetic separation of minerals, and more particularly to a separation in a continuous fluidized particulate feed thereof of magnetic particles, including weakly magnetic constituents, from nonmagnetic particles by turbulently streaming the feed through a high intensity magnetic field applied thereto.

PB-254 869/1GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
GFRP Rod and Rope for Structural Guy Applications.
Final rept.,
Nixon Halsey. Aug 74, 15p
Sponsored in part by Army Electronics Command, Fort Monmouth, N.J., Naval Facilities Engineering Command, Washington, D.C., Rome Air Development Center, Griffiss AFB, N.Y., and United States Information Agency, Washington, D.C. Pub. in Proceedings of American Society of Civil Engineers, v100 nEM4 p673-685 Aug 74.

Descriptors: *Anchors(Structures), *Fiberglass reinforced plastics, Rope, Rods, Fasteners, Tension tests, Fittings.

Tensile tests were conducted on GFRP rod and rope using five commercial structural guy termination grips and the relative performances of

the grips with these materials were evaluated. Stress-rupture tests at moderately elevated temperatures under low and saturated humidity conditions were carried out on two GFRP rod and rope materials and the stress-rupture characteristics of the materials were examined. Flexural tests were performed on three GFRP rod and rope materials from +77 to -80 F and the flexural moduli of the materials were evaluated. Simulated aeolian vibration tests were carried out on two GFRP rod and rope materials held under constant tensile loads using four types of commercial guy-termination grips and an NBS shear-type grip. The resistance to damage of these materials from aeolian vibration was observed up to 10 to the 8th power cycles. A series of 30-day storage tests were conducted on four GFRP rod and rope materials at temperatures ranging from 125 to 200 F. Several guide lines regarding minimum coil diameters and maximum exposure temperatures for long-term storage were established. Some residual strength tests were performed on the materials which had been exposed to long-term storage.

13J. Marine Engineering

AD-A027 182/5GA PC$3.50/MF$3.00
Stevens Inst of Tech Hoboken N J Davidson Lab
Steady and Unsteady Loadings and Hydrodynamic Forces on Counterrotating Propellers,
S. Tsakonas, W. R. Jacobs, and M. R. Ali. Apr 76, 13p Rept no. SIT-DL-76-1899
Contracts N00014-67-A-0202-0047, N00014-75-C-0483
Presented at the Symposium on Naval Hydrodynamics (11th), Apr 76, London (England).

Descriptors: *Counterrotating propellers, *Propeller blades, *Propellers(Marine), Hydrodynamic configurations, Mathematical models, Marine surface propulsion, Hydrodynamics, Loads(Forces), Moments, Computerized simulation, Digital computers, Nonuniform flow, Three dimensional flow, Load distribution, Wake, Interference, Thrust.

The linearized lifting surface theory has been applied to the evaluation of blade loadings and resultant hydrodynamic forces and moments (thrust, torque, bearing forces and bending moments) of counterrotating propeller systems with equal and unequal number of blades operating in uniform and nonuniform inflow fields, both units rotating with the same RPM. The mathematical model takes into account as realistically as possible the geometry of the propulsive device, the mutual interaction of both units and the three-dimensional spatially varying inflow field. A computer program has been developed adaptable to high-speed digital computers (CDC 6600-7600) for counterrotating propulsion systems of equal and unequal blade number in uniform inflow for comparison with experimental results if available. (Author)

AD-A027 183/3GA PC$6.00/MF$3.00
Naval Ship Engineering Center Hyattsville Md Hull Mechanical and Weapons Systems Div
ASR - 21/22 Four Point Moor Anchor Windlass Design Review,
R. D. Jamieson, J. C. Sandison, and M. Bartoszyk. 1974, 138p Rept no. 6162-74-4

Descriptors: *Anchor chains, Mooring, *Winches, *Anchors(Marine), Handling, Mooring buoys, Electric motors, Hydraulic equipment, Naval vessels, Catamarans, Sea rescue equipment, Catenaries, Computerized simulation, Sea states, Deep oceans.
Identifiers: ASR 21 vessel, ASR 22 vessel, Design.

This Center was requested to investigate and recommend alterations to correct difficulties being experienced by the ASR's 21 and 22, USS PIGEON and ORTOLAN, during deep sea mooring operations. The difficulties being experienced by the ships were found to fall in the following categories: (1) Anchor chains jumps off wildcat during payout operation; (2) Electric motors overload and stall during anchor retrieving operations in 1000 foot water; (3) Hydraulic components (pumps and motors) and fluid overheat; (4) Wildcat locking head dogs travel in their slots causing 'hammering' on the anchor windlasses; and (5) Wildcat shafts bushings (bearings) damaged during operations.

AD-A027 193/2GA PC$4.50/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Full-Scale Powering Trials of the Stable Semisubmerged Platform, SSP Kaimalino.
Final rept.,
Richard J. Stenson. Apr 76, 54p Rept no. SPD-650-01

Descriptors: *Semisubmerged, *Stabilized platforms, *Research ships, System test vessels, Full scale systems, Sea testing, Marine propulsion, Maneuverability, Velocity, Horsepower.
Identifiers: SSP Kaimalino, Kaimalino vessel.

The preparation, conduct, and analysis of full-scale powering trials on the Stable Semisubmerged Platform (SSP), SSP KAIMALINO, are presented. The overall trials program, sponsored by the Small Waterplane Area Twin Hull (SWATH), Ship Project Office, is discussed in general. Two specific areas, turning trials, and speed and powering trials, are presented in detail. Turning data revealed that the SSP has a tactical diameter on the order of ten to twelve ship lengths. Speed and powering data showed that the SSP was able to achieve a speed of 19.08 knots at an average shaft horsepower of 2936 (2189 kw), an average shaft RPM of 307.8, and an average propeller pitch of 90 inches (229 cm), while operating at 75 percent of design propeller shaft torque. Powering data obtained during rough water trials revealed an increase in powering of 5 to 6 percent over the power required in smooth water in order to maintain a speed of 17 knots in a high State 3 sea. The speed and powering data are compared to data obtained on an 11-foot (3.35) model, and are found to be in excellent agreement. (Author)

AD-A027 194/0GA PC$3.50/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Comparisons between Measured and Prediction Surge, Sway, and Yaw for LCU 1610 and FF 1006.
Final rept.,
A. E. Baitis, and T. R. Applebee. Jun 76, 25p Rept no. SPD-694-01

Descriptors: *Ship motion, *Seakeeping, Experimental data, Mathematical prediction, Ship models, Destroyers, Barges, Yaw, Surges, Ocean waves, Directional, Comparison, Transfer functions, Computerized simulation, Construction equipment.
Identifiers: LCU 1610 vessel, FF 1006 vessel, Sway(Motion).

Comparisons between experimental and predicted surge, sway, and yaw motions for an LCU 1610 and the FF 1006 operating at various headings to regular waves are presented. In addition, comparable predictions are given for an ocean construction barge. (Author)

AD-A027 235/1GA PC$5.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Ship Design Methodology for Maintenance Accessibility.
Study project rept.,
Stephen P. Light. Nov 75, 123p

Descriptors: *Shipbuilding, Maintainability, Access, Systems engineering, *Maintenance management, Naval vessels, Marine engineering, Systems analysis, Scheduling, Configurations, Position(Location), Ship auxiliary equipment, Marine engines.
Identifiers: *Ship design, *Naval architecture, *Accessibility, Design.

This report documents a systematic ship design methodology for 'designing-in' maintenance accessibility into the ship's design. Recent ship design projects, which have emphasized maintenance accessibility to varying degrees in the ship's design at the Naval Ship Engineering Center (NAVSEC), were analyzed and Based on the analysis and a ship design methodology for maintenance accessibility was developed and documented. It is intended that this report be used as guidance and as a baseline from which lessons-learned can be continually fedback to improve the maintenance accessibility implementation on future ship acquisition programs. Guidance is provided on the maintenance accessebility responsibilities, schedule, and required tasks and funds for all phases of Ship System Design, i. e., Conceptual Design, Preliminary Design and Contract Design.

AD-A027 241/9GA PC$5.50/MF$3.00
Naval Postgraduate School Monterey Calif
The Patrol Boat Navy: An Emergent Force in the Mediterranean.
Master's thesis,
Eugene Thomas Oatley. Mar 76, 119p

Descriptors: *Patrol craft, *Naval operations, *Mediterranean Sea, Surface to surface missiles, Shipboard, International relations, Comparison, Antiship missiles, Military forces(Foreign), Theses, Israelis, Arabs, North Africa, Middle East.
Identifiers: Arab-Israeli War(1974).

The study makes a comparative evaluation of the naval order of battle for nine Middle East and North African States with emphasis on the degree to which reliance on fast patrol craft has been placed. An examination of factors contributing to the development of patrol boat navies is offered with particular attention given to the Arab-Israeli Conflict, Foreign Power interests, and the move for Arab Independence. Finally, the study serves to illustrate the threat posed by missile-armed patrol craft in emerging navies world-wide.

AD-A027 376/3GA PC$4.50/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Hydrodynamic Forces and Stability Boundaries of a Hyperventilated Hydrofoil in Calm Water and in Regular Waves,
Ralph Stahl. Dec 75, 56p Rept no. SPD-649-01

Descriptors: *Hydrofoils, Hydrodynamics, Force(Mechanics), Stability, Lift to drag ratio, Hyperventilation, Taper.

Utilizing a submerged hydrofoil, a phenomenon of natural ventilation was experimentally investigated in both calm water and regular head waves. The phenomena, hereafter termed hyperventilation, is the development of a cavity extending several chords in length from the foil's leading edge. The cavity tail is open to the atmosphere with the result that the cavity pressure is equal to atmospheric pressure. In addition to measuring hydrodynamic forces exerted on the foil, an attempt was made to establish boundaries for stable hyperventilation. An expanded realm of stable hyperventilation was

obtained by adding a wedge to each side of the streamlined strut aft of the midchord. Hyperventilation-triggering methods were also investigated. Results are presented showing the variation of mean and oscillatory components of lift and drag coefficients and lift/drag ratios to mean foil depth in calm water and in regular head waves at various foil angles and speeds. (Author)

AD-A027 377/1GA PC$4.00/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
The Added Mass and Damping Coefficients of and the Excitation Forces on Four Axisymmetric Ocean Platforms,
Kwang June Bai. Apr 76, 33p Rept no. SPD-670-01

Descriptors: *Floating platforms, Oceans, Mass, Excitation, Damping, Numerical methods and procedures, Finite element analysis, Axisymmetric, Ocean waves, Coefficients.

This report presents numerical results of the added mass and damping coefficients of vertical axisymmetric bodies on or under the free surface. Also computed are the excitation forces on these bodies due to an incident regular wave system. The numerical scheme employs a localized finite-element method, which is based on the theor, of the calculus of variations. The excitation forces and moments on a submerged half-spheroid lying on the bottom are computed and compared with the results obtained by others. The agreement is good. Several specific types of floating vertical axisymmetric platforms are considered for ten different wave lengths, in connection with the design of an ocean-thermal converter platform. The added mass and damping coefficients, as well as the excitations, are presented. It is shown that simple strip theory gives a good approximation of the sway (and pitch) added mass for a disc platform having a long circular cylinder. (Author)

AD-A027 460/5GA PC$5.50/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
The Vertical Motion of an Air Cushion Vehicle and the Spatial Distribution of Cushion Pressure,
David D. Moran , and Richard S. Schechter. Apr 76, 109p Rept nos. SPD-615-02, DTNSRDC-SPD-615-02

Descriptors: *Air cushion vehicles, *Amphibious operations, *Pressure distribution, Naval research, Motion, Water waves, Heaving, Model tests, Landing craft, Test facilities, Instrumentation, Numerical analysis, Pitch(Motion).
Identifiers: Cushions.

The spatial and temporal distribution of pressure in the cushion of an air-cushion-supported vehicle operating over a rigid periodic wave field is reported. By comparing measured and computed angular (pitch) accelerations, it is shown that the spatial pressure distribution is the major mechanism for pitch excitation of the vehicle. The heave motion is found to be more dependent upon other mechanisms for the vertical excitation forces. Various forms of the spatial pressure distribution are examined using experimental data.

AD-A027 521/4GA PC$4.00/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Hydrodynamic Equilibrium Conditions for AG(EH) Main Strut-Pod-Foil System Using Flap Incidence Control,
D. W. Coder, and B. B. Wisler, Jr. Jun 76, 41p Rept nos. SPD-332-03, DTNSRDC-SPD-332-03

Descriptors: *Hydrofoil craft, *Power levels, Model tests, Control systems, Pivots, Hydrofoils, Leading edge flaps, Struts, Lift, Drag, Measurement, Test methods, Test equipment, Hydrodynamics.
Identifiers: *Power consumption, Pivoted foils.

The power requirements for hydrofoil craft control systems has been a subject of recent concern as the U.S. Navy considers larger and larger craft. Four hydrofoil configurations were investigated theoretically to determine power requirements to control a hydrofoil ship similar to the AG(EH) in a random sea, and a pivoted foil with leading-edge tab was found to consume the least power. To determine whether this configuration would actually consume the least power, a 1/12-scale model was examined for equilibrium flap/foil angle conditions ('stable flying situations') of the fully-wetted case. A passive control system comprised of mechanical linkages was used with the model to obtain steady-flow, fully-wetted conditions. The results of this experiment are discussed.

AD-A027 554/5GA PC$4.00/MF$3.00
Admiralty Experiment Works Haslar (England)
The Drag of an Accelerating Submarine. Part I. Skin Friction.
Technical rept.,
T. B. Booth. Jan 76, 28p AEW-TR-76003, DRIC-BR-52460

Descriptors: *Skin friction, *Submarine hulls, Acceleration, Deceleration, Drag, Potential flow, Boundary layer, Hydrodynamic control surfaces, Flat plate models, Submarine models, Great Britain.
Identifiers: High speed submarines.

Potential flow theory predicts that a body accelerated or decelerated in motion in a straight line in a fluid will experience an inertia force greater than that due to the mass of the body - a so called added mass effect. Submarine trials confirm the phenomenon but indicate that for motion in the fore and aft direction the added mass is much greater than predicted. This could be due to: (1) transient loss of thrust from the propeller, (2) changes in skin friction due to the acceleration, (3) changes in form drag due to the acceleration. Towing testa have been conducted on a body without propeller. These eliminate (1) as the primary cause. A theoretical and experimental study of (2) has been made for a flat plate. Theory predicts an increase in skin friction for both laminar and turbulent boundary layers, but experiment on the turbulent layer only partially supports the theory. Although further analysis of the data is desirable, the results suggest that acceleration may restore a measure of laminar flow in the boundary layer. Further work should concentrate on this aspect and on the effect of acceleration on form drag.

AD-A027 567/7GA PC$4.00/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Experimental Hydromechanical Performance Evaluation of a Submarine Towed Communications Buoy Model.
Departmental rept.,
Bruce Webster, and John F. Campbell. Apr 76, 32p Rept no. SPD-661-01

Descriptors: *Communication buoys, *Underwater communications, Submarines, Towed bodies, Stability, Hydrodynamic configurations, Hydromechanics, Data acquisition, Control systems, Submarine antennas, Velocity, Models, Shape.
Identifiers: *Submarine communications.

The towing performance and stability of a buoy model having a NACA 4424 profile shape were experimentally investigated to explore the feasibility of developing a buoy to operate from submarines at higher speeds and deeper depths than were previously obtainable. Buoy parameters of tension, cable angle, pitch, roll and depth were measured for several towpoint locations, static depths, antenna conditions and stabilizer angles. Results indicate that a buoy with a NACA 4424 shape will perform satisfactorily at speeds up to 25 knots. (Author)

AD-A027 598/2GA PC$3.50/MF$3.00
Pennsylvania State Univ University Park Applied Research Lab
Cavitation Research at the Garfield Thomas Water Tunnel.
Technical memo.,
J. W. Holl, R. E. A. Arndt, M. L. Billet, and C. B. Baker. 21 Mar 74, 22p Rept no. TM-74-62
Contract N00017-73-C-1418
Presented at the Cavitation Conference, 5-7 Sep 74, Edinburgh (Scotland).

Descriptors: *Cavitation, *Propellers(Marine), Water tunnels, Hubs, Vortices, Jets, Polymers, Additives, Hydrodynamics, Thermodynamics, Reynolds number, Shear properties, Axisymmetric, Flow fields, Experimental data.
Identifiers: Hub vortex cavitation, *Drag reduction fluids.

Current research at the Garfield Thomas Water Tunnel of the Applied Research Laboratory, The Pennsylvania State University is in the areas of hub vortex cavitation, the effects of polymer additives, roughness effects and thermodynamic effects. Primary emphasis in this paper will be on the first two areas for the flow regime of limited cavitation. The effects of Reynolds number and vortex breakdown on hub vortex cavitation are presented. Experimental results for the effects of polymer additives on shear flow and on flows about axisymmetric bodies are discussed. A brief description of research on roughness and thermodynamic effects completes the paper. (Author)

PAT-APPL-679 127/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Silent Self-Controlled Orificial Restrictor.
Patent Application,
James F. Holliston, James E. McGill, and William H. Stoddard. Filed 21 Apr 76, 9p AD-D002 609/6
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Underwater vehicles, *Ballast tanks, *Valves, Orifices, Fluid control, Hovering, Noise reduction, Flow noise.
Identifiers: *Patent applications, PAT-CL-137-675.

The patent application relates to an orificial restrictor for use in a ballasting system for an underwater vehicle, using a plurality of multiholed orifice plates set in series within a casing. A hollow cylinder is slidably positioned within the casing and carries fluid supplied through an inlet in the case. A spring biases the cylinder toward the inlet and fluid pressures opposes the spring force to move the cylinder away from the inlet whereby the hollow cylinder automatically positions itself with pressure changes to control the number of orifice plates subject to flow.

PB-254 803/0GA PC$6.75/MF$3.00
Puerto Rico Economic Development Administration, San Juan.

Study of the Feasibility of Establishing Shipbuilding/Shiprepairing Facilities at Guanica Bay.
Final rept.
15 Jul 76, 158p
Grant EDA-01-6-01286

Descriptors: *Shipyards, *Project planning, *Puerto Rico, Feasibility, Shipbuilding, Construction, Ships, Barges, Facilities, Marketing, Environmental impacts, Fleets.
Identifiers: Guanica Bay.

A feasibility study is reported for the establishment of a shipyard in Puerto Rico. The design of shipbuilding and ship repair facilities incorporates features of modern technology that facilitate a rapid build-up of production. One main objective is to allow shipbuilding to commence within six months of a decision to proceed. Included is an expansion of construction facilities, construction of barges and construction of vessels up to 100 m in length. Results of the study are favorable to the establishment of such a project.

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

N76-25540/5GA PC$5.50/MF$3.00
AiResearch Mfg. Co., Phoenix, Ariz.
Program to Design, Fabricate, Test, and Deliver a Thermal Control-Mixing Control Device for the George C. Marshall Space Flight Center.
T. S. Thurston, and R. H. Larson. 12 Apr 76, 108p NASA-CR-144327, AIRESEARCH-76-411348(1)
Contract NAS8-31289

Descriptors: *Control valves, *Mixers, *Temperature control, *Temperature sensors, Fabrication, Fluidics, Freon, Noise reduction, Performance tests, Product development, Pulse duration modulation, Viscosity.

For abstract, see STAR 1416

PB-255 710/6GA PC$4.50/MF$3.00
Bureau of Reclamation, Washington, D.C.
Protection of Drains from Silting and Flushing Out the Drainage System.
1976, 66p TT-75-59002
Trans. of mono. Zashita Dren ot Zailiniya i Promyvka Drenazha, Yelgava, 1972. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Drains, *Plastics, *Ceramic materials, *Underground corrosion, Underground drains, Translations, USSR.

The rational measures to protect drainage systems from silting were comprehensively studied at laboratory conditions, on a specially constructed-proving ground. The state of the previous experimental systems, which were built using different protecting materials (glass linen, glass cloth, mineral wool, moss, peat, surface soil and others) was evaluated. The operational state of these materials was studied in industrial conditions, and the accumulated experience of using new protecting materials such as pottery and plastic was generalized. In drainage systems, the mechanical and chemical process of silting was studied according to the applied-protecting materials. Silting of drains by iron compounds was investigated according to shape or kind of drain pipes and filter-protecting materials. The result was the development, at field conditions, of advanced and tested methods for protecting the drainage systems from silting in mineral and peat soils and also in iron-oxide-rich soils.

13L. Safety Engineering

AD-A027 181/7GA PC$4.50/MF$3.00
National Academy of Sciences Washington D C
Matrix of Electrical and Fire Hazard Properties and Classifications of Chemicals.
Final rept.,
1975, 75p USCG-D-82-76
Contract DOT-CG-41680-A

Descriptors: *Electrical equipment, *Fire hazards, Reduction, Hazards, Electricity. Classification, Chemicals, Chemical properties, Physical properties, Flammability, Tables(Data), Acids, Anhydrides, Alcohols, Aldehydes, Alkanes, Cycloalkanes, Amines, Aromatic compounds, Esters, Ethers, Glycols, Halides, Ketones, Nitriles, Olefin polymers, Coast Guard.
Identifiers: *Electrical hazards.

The National Research Council Committee on Hazardous Materials established an Electrical Hazards Panel to make a detailed study of physical and flammability properties of vapors in order to assign classifications to chemicals of commerce according to the classification groups given in the National Electrical Code, Article 500. This MATRIX of ELECTRICAL AND FIRE HAZARD PROPERTIES AND CLASSIFICATIONS OF CHEMICALS was prepared for use by the Panel as an aid in the classification of each chemical. The Coast Guard requested that it be published so that a permanent record of the data, which had only been made available to the Panel, would be retained and could be enlarged on in the future. The MATRIX does not represent an exhaustive coverage of the literature, but it is believed the most reliable references were used in assembling the data. (Author).

AD-A027 189/0GA PC$3.50/MF$3.00
Naval Weapons Center China Lake Calif
Practical Risk Analysis for Safety Management.
Final rept.,
G. F. Kinney , and A. D. Wiruth. Jun 76, 20p Rept no. NWC-TP-5865

Descriptors: *Safety, *Risk analysis, Operations research, Management, Numerical analysis, Accidents, Hazards, Exposure(Physiology).

This report describes a practical risk analysis system which can be used for the quantitative characterization of risks and for the evaluation of proposed riskreduction procedures. The system uses numerical values for comparison purposes and provides descriptive terms that are meaningful to personnel in safety, operations, and management. The analysis functions are performed either algebraically or graphically on nomographs provided in the report.

AD-A027 726/9GA PC$3.50/MF$3.00
Analytics Inc Willow Grove Pa
Structural Modification of the 'Three Dimensional Crash Victim Simulation' (3 DCVS) Software.
Technical rept.
20 May 76, 15p Rept no. TR-1194-A

Descriptors: *Computer program documentation, *Computer programs, *Crash injuries, Three dimensional, Subroutines, Core storage, Costs, Time, Savings, Variables, Modification, Computer files, Overlays.
Identifiers: *Computer software, *3D crash victim simulation.

The 3DCVS software was to be modified to accomplish the following objectives: (1) Reduce core requirement for simulation execution; (2) Reduce simulation execution costs; (3) Improve job turnaround time; and (4) Make core available for further extention of the 3DCVS.

PAT-APPL-689 757/GA PC$3.50/MF$3.00
Department of the Interior, Washington, D.C.
A Submicron Particle Detector.
Patent Application,
Martin Hertzberg, Charles D. Litton, and Randall Garloff. Filed 25 May 76, 14p* PB-255 369/1, DOCKET/MIN-2395
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Fire detection systems, *Patent applications, Detectors, Ultrafines, Air pollution, Monitors, Ionization chambers, Coal mines, Smoke, Particles.
Identifiers: *Smoke detectors, Mine safety, Charge transfer, *Air pollution detection.

The patent application relates to a combined improved fire detector, incipient combustion detector and/or a particulate pollution monitor. The triode detector forming the subject of the invention has a gas tight housing enclosing a charging chamber with an inner and outer electrode arranged as two generally concentric cylindrical electrodes. To achieve a symmetrical bipolar charge region near the inner electrode, this electrode has a radio-active source with a covering to limit the effective travel distance of emitted radioactive particles. Remote from this chamber is a third electrode used to collect a secondary current when charged particles impinge thereon. Circuitry is provided to measure this secondary current which relays the desired information on the detected particles. There is also a pump system to move ambient air into the chamber and to the collection electrode.

PATENT-3 963 202 Not available NTIS
Department of Transportation, Washington, D.C.
Grade-Crossing Motorist Warning System.
Patent,
John B. Hopkins. Filed 3 Mar 75, patented 15 Jun 76, 7p PB-254 995/4, PAT-APPL-555 021 Supersedes PB-239 605.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Warning systems, *Patents, Intersections, Railroads, Xenon lamps, Incandescent lamps, Flashing, Control circuits, Synchronism.
Identifiers: *Railroad grade crossing signals, *Flashing warning signals, PAT-CL-246-125.

The patent describes a railroad-highway grade-crossing warning system accomplished by control circuitry for synchronizing the flash rates of incandescent and xenon lamps so as to produce a continuously uniform signal pattern which can be rapidly identified and understood by a motorist.

PB-254 808/9GA PC$4.00/MF$3.00
National Transportation Safety Board, Washington, D.C. Bureau of Surface Transportation Safety.
Collision of a Crown-Trygg Construction Company Truck with an Amtrak Passenger Train, Elmwood, Illinois, November 19, 1975.
Railroad/Highway accident rept.
12 May 76, 26p NTSB-RHR-76-2

Descriptors: *Railroads, *Accident investigations, Collision research, Intersections, Highways, Trucks, Visibility, Rail transportation, Passenger transportation, Injuries, Traffic engineering, Traffic safety, Illinois.
Identifiers: *Railroad accidents, High speed trains, Railroad highway crossings, Railroad highway accidents, *Railroad derailments.

At 9:10 a.m., c.s.t., on November 19, 1975, Amtrak turboliner passenger train No. 301 was struck by a loaded dump truck on a grade crossing in Elwood, Illinois. The crossing was unprotected and had limited sight clearance between the road and the track. Four cars of the five-car train were derailed and 41 persons were injured. The train was owned by Amtrak and was operated by an Illinois Central Gulf Railroad (ICG) crew over the ICG track. The road was a county highway maintained by the Will County Highway Department. The National Transportation Safety Board determines that the probable cause of the accident was the failure of the truckdriver to stop his vehicle short of the track until it was safe to proceed. Contributing to the accident was the inadequate sight clearance between the road and the track on the approach to the unprotected grade crossing.

PB-254 965/7GA PC$4.00/MF$3.00
National Transportation Safety Board, Washington, D.C. Bureau of Surface Transportation Safety.
Derailment of Amtrak Train on Louisville and Nashville Railroad, Pulaski, Tennessee, October 1, 1975.
Railroad accident rept.
10 May 76, 35p NTSB-RAR-76-6

Descriptors: *Railroads, *Accident investigations, Locomotives, Railroad cars, Accidents, Damage, Injuries, Safety engineering, Rail transportation, Passenger transportation, Tennessee.
Identifiers: *Railroad accidents, Highspeed trains, *Railroad derailments.

About 12:50 p.m. on October 1, 1975, 1 locomotive unit and 11 cars of Amtrak train No. 315 derailed on the Louisville and Nashville Railroad Company's track near Pulaski, Tennessee. Of the 69 persons on the train, 31 were injured. Property and equipment damage amounted to about $1,067,000. The National Transportation Safety Board determines that the probable cause of this accident was the overturning of the outside rail in a 3 degree 8 foot curve by high lateral forces induced by the six-wheel truck of the SDP-40-F locomotive; these forces exceeded the capability of the track which met current FRA standards. The speed of the locomotive, although not greater than the speed allowable for Class 4 track, was too great to be sustained by the track.

PB-255 651/2GA PC$3.50/MF$3.00
National Transportation Safety Board, Washington, D.C. Bureau of Surface Transportation Safety.
Collision of Penn Central Transportation Company Operated Passenger Trains Numbers 132, 944, and 939 Near Wilmington, Delaware, October 17, 1975.
Railroad accident rept.
16 Jun 76, 23p NTSB-RAR-76-7

Descriptors: *Railroads, *Accident investigations, Passenger transportation, Collisions, Railroad signals, Regulations, Collision research, Injuries, Delaware.
Identifiers: *Railroad accidents, Railroad derailments.

On October 17, 1975, about 6:37 p.m., a northbound Penn Central Transportation Company (Penn Central) passenger train, No. 944, struck the rear of Penn Central passenger train No. 132, which had made an unscheduled stop near Wilmington, Delaware, because of an equipment malfunction. Train No. 939, a southbound Penn Central passenger train that was approaching on an adjacent track, struck the derailed equipment from No. 944. The collisions injured 25 persons and caused property damage of $817,866. The National Transportation Safety Board determines that the probable cause of the rear end collision was the engineer's failure to operate his train according to established procedures. Contributing to the accident was the operational practice of the railroad industry which permits trains to enter occupied blocks. The second collision was caused by the absence of flagging.

PB-255 864/1GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Fire Loads and Live Loads in Buildings.
Final rept.,
Charles Culver. 1976, 10p
Pub. in Proceedings of International Conference on Performance of Building Structures, Glasglow, Scotland, March 31-April 1, 1976, 1, p111-119 (Pentech Press Ltd., London, England, 1976).

Descriptors: *Fire safety, *Buildings, Surveys, Data acquisition, Loads(Forces), Office buildings, Schools, Projects, Furniture, Organizations, Classifications, Components.
Identifiers: Rooms.

The development of a nation-wide survey program for determining fire loads and live loads in buildings and establishing the factors which affect these loads is described. Considerations involved in planning the program and the type of data collected are included. Preliminary survey results obtained from the NBS Administration building are described.

PB-255 954/0GA PC$7.50/MF$3.00
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
Design for NASS: A National Accident Sampling System. Volume II. Appendices.
Final rept. Jun 74-Jul 75 on Phase 1,
J. O'Day, A. Wolfe, and R. Kaplan. May 76, 194p
UM-HSRI-SA-75-14-2, DOT-HS-801 914
Contract DOT-HS-4-00890
See also Volume 1, PB-254 038.

Descriptors: *Accident investigations, *Motor vehicle accidents, *Sampling, *Benefit cost analysis, Injuries, Damage, Pedestrians, Bicycles, Motorcycles, Motor vehicles, Collision research, Data processing.
Identifiers: National estimates, NASS(National Accident Sampling System), National accident sampling system.

A design is presented for a national accident investigation program based on sampling theory. By limiting the number of investigations within a strict sampling plan it is possible to record sufficient detail about each accident to produce national estimates of injury, property damage, and other accident characteristics which will be useful in cost-benefit analyses. The system described has three major facets--a program for continuous acquisition of data of a random sample of all towaway-pedestrian-bicycle-motorcycle accidents occurring in the U.S., a program for occasional acquisition of additional data on selected topics quickly and on-call, and a program for conducting in-depth or multidisciplinary accident investigations for accidents of particular interest.

13M. Structural Engineering

AD-A027 149/4GA PC$5.00/MF$3.00
Pennsylvania State Univ University Park Materials Science Lab
Shock Analysis of Viscoplastic Beams.
Progress rept. no. 1, 1 Jan-31 Dec 75,
S. J. Yim, and V. H. Neubert. Dec 75, 86p
Contract N00014-75-C-0759

Descriptors: *Cantilever beams, *Box beams, *Viscoplastic properties, Loads(Forces), Bending, Dynamic response, Strain hardening, Strain rate.

There are three reports under one cover. First is a theoretical study of the viscoplastic response at a beam cross-section based on a strain-rate sensitive constitutive equation with strain hardening. Time delay between peak moment and peak curvature is determined. The second deals with the effect of using various relationships between static moment and curvature. The third presents some preliminary results of a numerical solution for the base motion response of a viscoplastic beam with immovable hinged ends, considering combined tension and bending.

AD-A027 384/7GA PC$5.00/MF$3.00
Construction Engineering Research Lab (Army) Champaign Ill
Seismic Design Methods for Military Facilities -- Preliminary Recommendations.
Interim rept.,
William K. Stockdale. Jun 76, 80p Rept no. CERL-IR-M-184

Descriptors: *Military facilities, *Earthquake resistant structures, Earthquake engineering, Dynamic response, Seismic waves, Degrees of freedom, Damping, Structural response, Ground motion.

This report presents preliminary recommendations for the methods of structural analysis to be used in the design of critical facilities on military installations. The recommended dynamic analysis methods are described and discussed, and examples are presented which illustrate the elastic and inelastic response spectra methods. It is recommended that dynamic methods be used in all areas where the expected ground acceleration exceeds 0.10 g.

NTIS/PS-76/0630/4GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Industrialized Housing (A Bibliography with Abstracts).
Rept. for 1964-Jul 76,
Guy E. Habercom, Jr., and Gerald H. Adams.
Aug 76, 201p*
Supersedes NTIS/PS-75/571.

Descriptors: *Bibliographies, *Houses, *Prefabrication, Construction materials, Technology, Tests, Cost analysis, Guidelines, Building codes, Projects, Performance standards, Planning, Human factors engineering, Acoustic properties, Structural engineering, Loads(Forces), Fire protection, Residential buildings, Electrical codes, Air conditioning, Heating, Design criteria, Utilities.
Identifiers: *Industrialized housing, Breakthrough operation, Mobile homes.

Abstracts relevant to construction materials, environment testing, costs, and construction guidelines for industrialized building are cited. Much of the research was generated by the Department of Housing and Urban Development (HUD) and its Breakthrough Operation. Prefabrication techniques employed by numerous foreign countries are reviewed. (This updated bibliography contains 195 abstracts, 36 of which are new entries to the previous edition.)

PB-255 071/3GA PC-GPO
Bureau of the Census, Washington, D.C.
Construction Reports: Residential Alterations and Repairs. Expenditures on Residential Additions, Alterations, Maintenance and Repairs, and Replacements.
Annual rept. 1975.
Apr 76, 43p C50-75-A
See also COM-71-50188.
Paper copy available from GPO.

Descriptors: *Residential buildings, *Expenses, Economic surveys, Maintenance, Statistical data, Replacing, Classifications, Data acquisition, Construction.
Identifiers: Expenditures, Alterations, Repairs, Property owners.

The annual report covers annual, quarterly, and regional expenditures made by owners of all types of residential properties. The expenditures are classified by general category such as additions, alterations, and major replacements and by some specific types of work such as plumbing, roofing, and painting. Detailed statistics relating expenditures to property, household, and geographic characteristics are presented for owner occupants of one-housing unit residential properties.

PB-255 075/4GA PC$4.50/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Building Technology.
Structural Performance of Masonry Walls Under Compression and Flexure.
Final rept.,
S. G. Fattal, and L. E. Cattaneo. Jun 76, 66p
NBS-BSS-73
Sponsored in part by Department of the Army, Washington, D.C., Department of the Navy, Washington, D.C., and Department of the Air Force, Washington, D.C. Library of Congress Catalog Card no. 75-619305.

Descriptors: *Walls, *Bricks, *Concrete blocks, Compressive strength, Flexural strength, Masonry, Construction materials, Buckling.

Ninety-five prisms and fifty-six walls of brick, concrete block and composite brick and block masonry construction were tested under various combinations of compressive and transverse loads. Constitutive relations for masonry are developed from test results. By using rational analysis it is shown that prism strength can be predicted on the basis of linear behavior at failure. It is also shown that wall strength can be predicted on the basis of prism strength when an appropriate allowance is made for the effect of wall slenderness on sectional capacity.

PB-255 086/1GA PC-GPO
Bureau of the Census, Washington, D.C.
Construction Reports. Value of New Construction Put in Place.
Monthly rept. Mar 76.
May 76, 14p C30-76-3
See also COM-74-70568.
Paper copy available from GPO.

Descriptors: *Construction, *Economic surveys, Estimates, Classifications, Value, Rates(Per time), Statistical data, Limits, Census.
Identifiers: New construction, Ownership, Monthly summaries, Construction reports.

The report presents estimates of the value of total new construction put in place, by type of construction (residential, non-residential, public utility, military, etc.) and by type of owner (private, state-local governments, and federal government). Seasonally adjusted annual rates in current and in 1967 dollars are also shown. Appendix A (published annually) provides the series of directly measured data used in preparing the value-in-place estimates, except those covering federally owned construction. Appendix B (also published annually) identifies the basic data sources and outlines the assumptions and procedures used in the preparation of value-in-place estimates.

PB-255 087/9GA PC-GPO
Bureau of the Census, Washington, D.C.
Construction Reports. New Residential Construction in Selected Standard Metropolitan Statistical Areas. First Quarter 1973--Third Quarter 1975.
Quarterly rept. nos. 1/3.
Mar 76, 23p C21-75-Q-3
Paper copy available from GPO.

Descriptors: *Residential buildings, *Construction, *Metropolitan areas, Surveys, Housing studies, Land titles, Estimates, Statistical data, Municipalities.
Identifiers: *New construction, Standard metropolitan statistical areas, Private ownership.

The report provides quarterly estimates for 13 selected standard metropolitan statistical areas (SMSA's) on the number of new privately owned residential housing units authorized by building permits, authorized but not yet started, started, completed, and under construction. Annual totals are given also. Appendix A, published periodically, describes the sample design, estimation procedure, limitations and reliability of the estimates for the survey; and Appendix B defines the SMSA's for the permit-issuing areas covered in the report.

PB-255 104/2GA PC$3.50/MF$3.00
Institute for Building Science, Budapest (Hungary).
Some Aspects of the Construction of Industrial Projects in Developing Countries - Based on Hungarian Experience.
Analysis of development, science organization, informatics bulletin,
E. Csorba. 19 Dec 74, 15p Bull-17

Descriptors: *Construction, Developing countries, *Technical assistance, Economic surveys, Economic factors, Manpower, Shortages, Hungary, Prefabrication, Reinforced concrete, Planning, Design criteria, Technology transfer.

The need of developing countries for developing the industrial construction sector and obtaining technical assistance to achieve this objective in the fastest and most effective way is a well-known fact. Though there is a big variety in the conditions of various developing countries in different parts of the world, certain common factors appear in almost all cases. Many of these factors were characteristic for Hungary in the past three decades, and it can be helpful to see what could be used from the Hungarian experience in this field.

PB-255 105/9GA PC$4.00/MF$3.00
Institute for Building Science, Budapest (Hungary).
Prefabrication for Industrial Construction.
Construction and production technology bulletin,
E. Csorba. 1 Sep 75, 40p Bull-18

Descriptors: *Construction industry, *Industrial buildings, *Prefabrication, Industrial plants, Standardization, Modular structures, Construction management, Hungary.
Identifiers: *Prefabricated buildings.

The correct design of industrial buildings is demanding the elaboration of all details in regard of their economy, technology, architecture, etc., and in addition the consideration of the economical and political aims in connection with the establishment of the industrial plant in question, together with the examination of the results of the development of the settlement. A decisive factor affecting the plan-fulfilment is given by the rate of the construction work from which the increase of the productivity of the building-industry as well as the decrease of the cost depends. These facts are compelling the architects of industrial buildings to search for all possible ways during the design process and the construction works as well. In particular during the planning of typified buildings these have to be evolved that in respect of the investment and operation the most economic industrial buildings should be erected for the national economy. The development of the methods of planning is characterized by the expansion of typification. In Hungary typification started with the typification of structures. The proper and correct structural typification has to be preceded by the modular co-ordination, by the establishment of the characteristic measurements of the industrial halls, and by normalization. The report expands on this theme.

PB-255 643/9GA PC$4.50/MF$3.00
ENSCO, Inc., Springfield, Va.
Establishment of Interim Standards for Bridge Rails Required to Contain Heavy Vehicles. Volume 4. Development of Simplified Input and Flexible Criteria Capabilities for the BARRIER VII Program.
Final rept. Jul 73-May 75,
J. A. Bloom. May 75, 58p FHWA/RD-75-83
Contract DOT-FH-11-8147

Descriptors: *Highway bridges, *Barriers, *Traffic safety, Computerized simulation, Impact tests, Flexibility, Design criteria, Safety engineering, Trucks, Passenger vehicles, Dynamic response, Structural engineering, Computer programs.
Identifiers: Barrier 7 program.

The BARRIER VII program, which simulates the impact of vehicles with flexible barriers, was modified in order to simplify the input requirements. The simplified format eliminates the complex modeling required of the user and allows selection of prestored vehicle and barrier data from the program's library. The flexible barriers criteria developed under this contract was automated to enable the user to check the general tendency of a barrier design to safely contain vehicles of various weights.

PB-255 877/3GA PC$5.50/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Building Technology.
Building Technology Project Summaries.
Final special pub.,
Michael Olmert. Apr 76, 111p* NBS-SP-446

Descriptors: *Construction industry, *Buildings, *Technology assessment, Construction management, Building codes, Research projects, Management planning, Construction materials, Structural analysis.
Identifiers: *Energy conservation.

The Center for Building Technology provides the technical and scientific bases for criteria and standards that improve the usefulness, safety, and economy of buildings while conserving building materials and energy. The Center's activities support the building technology program of the Federal, State and local government; assists design professions, building officials and the research community by developing design criteria that improve buildings; and assists manufacturers of building products by developing criteria for evaluating innovative building materials. This report summarizes the Center's projects for calendar year 1975. It enables individuals to get a clear impression of CBT research activities.

14. METHODS AND EQUIPMENT

14A. Cost Effectiveness

AD-A027 666/7GA PC$4.00/MF$3.00
Joint Tactical Communications Office Fort Monmouth N J
Cost Effectiveness Program Plan for Joint Tactical Communications. Volume III. Life Cycle costing. Appendix G. Cost Uncertainty Analysis Model.
Final rept.,
Eugent T. Boyd. May 76, 46p Rept no. TTO-ORT-032-76-V3-AP-G

See also Volume 3A, AD-A021 938.

Descriptors: *Cost effectiveness, *Life cycle costs, *Tactical communications, Uncertainty, Fortran, Computer programming, Joint military activities.

This appendix presents some of the possible approaches for treating cost uncertainty and to present the approach and model which the TRI-TAC Office uses to augment the methodology for estimating life cycle costs. A Cost Uncertainty Model Program User's Guide and a Cost Uncertainty Model Program are also included. (Author)

14B. Laboratories, Test Facilities, and Test Equipment

AD-A027 171/8GA PC$3.50/MF$3.00
IIT Research Inst Chicago Ill
Standard Reference Element for Nondestructive Test of Filter-Coalescer Elements.
Final rept.,
Edward G. Fochtman, and Victor R. Ivanuski.
Mar 76, 13p Rept no. IITRI-C6337-13
Contract DAAK02-75-C-0120

Descriptors: *Filters, *Liquid crystal display systems, *Nondestructive testing, Coalescence, Standards, Experimental design, Powder metals, Test equipment.
Identifiers: Reference elements.

Under a previous contract a nondestructive tester for filter-coalescer elements was designed, built, and evaluated. The current program was designed to develop a reference element of known characteristics which would not vary with time or location. Such a reference element has been developed, and is described in this report. A secondary objective of this program was to investigate the use of a liquid crystal indicator system and to deliver such a system as an alternative to the tracer-gas-dye system. A liquid crystal system has been selected, and the system and operating conditions are specified.

AD-A027 195/7GA PC$6.00/MF$3.00
Science Applications Inc Atlanta Ga
Digital Photon Correlation Data Processing Techniques.
Final rept. 3 May 74-31 Oct 75,
W. T. Mayo, Jr. Jul 76, 135p AEDC-TR-76-81
Contract F40600-74-C-0016

Descriptors: *Data processing, *Photons, *Laser velocimeters, Signal processing, Correlation techniques, Light scattering, Particles, Counting methods, Flow rate, Flowmeters, Velocity, Fluids.

Presently available laser velocimeter (LV) electronic signal processing techniques are often inadequate for detection of light scattered by small scattering particles which are required for following the fluid motions. Example situations include low pressure and/or high velocity measurements. In other situations detection of larger scattering particles is difficult due to limited system sensitivity. Photon counting techniques offer improved system sensitivity by allowing velocity measurements to be made even when there are insufficient signal photons available to define the classical scattering signal. Such techniques are thus applicable when the presently used classical techniques are not. The objective of this contract was the theoretical and experimental development of a new type of photon-counting processor for low-level dual-scatter LV signal detection. The contract was conducted in three separately funded phases: the first was a mathematical feasibility and preliminary hardware design study for a photon-counting processor; the second was a more detailed study of the statistical nature of low-level LV signals and their effects on low-level signal processing; and the third phase was the detailed design, construction, and demonstration of a new photon counting signal processor for photon resolved laser velocimeter signals. The effort under this contract has resulted in several significant conclusions both theoretical and experimental. (Author)

AD-A027 394/6GA PC$7.50/MF$3.00
Cold Regions Research and Engineering Lab Hanover N H
Effect of Sediment Organic Matter on Migration of Various Chemical Constituents During Disposal of Dredged Material.
Final rept.,
B. E. Blom, T. F. Jenkins, D. C. Leggett, and R. P. Murrmann. May 76, 183p WES-CR-D-76-7
Report on Dredged Material Research Program.

Descriptors: *Sediment transport, *Waste disposal, *Organic materials, Water analysis, Chemical analysis, Concentration(Composition), Solubility, Metals, Fresh water, Sea water, Hydrocarbons, Nutrients, Water analysis, Heavy metals, Nitrogen, Phosphorus, Water pollution, Chelation, Sampling, Dredging, Water quality, Minerals.
Identifiers: Water pollution sampling, *Solid waste disposal, Dredge spoil, Humic acids.

The disposal of both freshwater and saltwater sediments in open waters has been experimentally investigated in the laboratory. The emphasis of the experimental work was directed towards identifying the role that sediment organic carbon has in controlling various water-quality parameters at disposal sites. Long-term studies examined the possibility of transport of material from sediments into an overlying water column as well as monitoring the changes in the aqueous phase which initially contained large amounts of suspended matter. For the latter case, metal and nutrient concentrations were initially high but decreased significantly with time. Exceptions to this behavior were noted. Specific components were identified which migrated from the sediment into the water column. They include ammonium-nitrogen, orthophosphate, cadmium, and manganese, the latter only in seawater media. Organic carbon and inorganic nitrogen underwent transformations with the systems investigated. Both sediment organic carbon and soluble organic matter were generally found to have no demonstrable effect on water quality. Exceptions to this general conclusion were found in two sediments containing significant amounts of petroleum hydrocarbons.

AD-A027 433/2GA PC$5.50/MF$3.00
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
A Digital Controller for Horizontal Angular Motion of the FJSRL Seismic Isolation Platform.
Master's thesis,
Martin J. Burkhart. Jun 76, 122p Rept no. GE/EE/76-6

Descriptors: *Stabilized platforms, *Control systems, Digital systems, *Inertial navigation, Stochastic processes, Digital computers, Pneumatic devices, Horizontal stabilizers, Kalman filtering, Navigation computers, Navigational aids.
Identifiers: *Seismic isolation platforms, Horizontal angular motion, Stochastic controllers, Inertial instrument testing, Design, Digital control systems, Stochastic control.

This study is part of a continuing effort to develop a stochastic controller for the angular motion about a horizontal axis of the Seismic Isolation Platform at the Frank J. Seiler Research Laboratory. The design of a digital controller is investigated based on the assumption that a Kalman filter would provide sufficiently accurate estimations of the states of the system. The design specifications are to maintain angular position within + or - 0.001 arcseconds and angular velocity within + or - 1.6 x 0.00001 arcseconds per second for a step function of 1.25 ft-lbs applied to the platform. Discrete models for the platform and two actuators are developed. The discrete models are used to design a controller for each actuator. A controller for the pneumatic actuator is designed to force the platform to a zero steady-state position. An optimal controller, which regulates the closed pneumatic loop, is designed for the shaker actuator. A theoretical evaluation of the control system shows angular position is maintained within + or - 2.81 x 0.0001 arcseconds and angular velocity has a peak overshoot of 2.24 x 0.01 arcseconds per second but settles to within the design specification in 0.08 seconds.

AD-A027 496/3GA MF$3.00
IIT Research Inst Chicago Ill
Turbine-Engine-Particulate Sampler: Design Study.
Final rept. 1 Feb-30 Jun 75,
Donald L. Fenton. May 76, 71p IITRI-C6330-5, SAM-TR-76-1
Contract F41609-75-C-0024
Availability: Microfiche copies only.

Descriptors: Air pollution, *Jet engine exhaust, *Particulates, Turbines, Sampling, Aromatic compounds, Simulators, Polycyclic compounds, Samplers, Aircraft exhaust, Literature surveys, Degradation.
Identifiers: Polynuclear compounds, Benzopyrenes, Aromatic polycyclic hydrocarbons.

A turbine-engine-particulate sampler was designed to maximize overall collected mass for subsequent polynuclear aromatic (PNA) compounds and polycyclic aromatic material analyses. Special design features significantly reduce sample degradation problems and constrain total sampling time to 30 minutes. The sampling concept is a result of a comprehensive literature search and thorough analysis. This PNA sampler extracts the exhaust sample through a multiple-point probe, transports the sample to a conditioner, and collects the particles onto a glass-fiber filter. The conditioner not only reduces the sample temperature, permitting condensation, but also simulates the atmospheric dilution process. A bypass circuit permits sampler operation without actually collecting particles. (Author)

AD-A027 704/6GA PC$4.00/MF$3.00
Drexel Univ Philadelphia Pa Dept of Mechanical Engineering and Mechanics
Ultrasonic Procedures for the Determination of Bond Strength.
Interim rept.,
Joseph L. Rose. 1976, 38p AFOSR-TR-76-0737
Grant AF-AFOSR-2480-73

Descriptors: *Ultrasonic tests, *Nondestructive testing, *Bonded joints, Strength(Mechanics), Computer applications, Data acquisition, Signal processing.

Substantial progress was made in developing a sound resource base in model analysis, data acquisition, and signal processing for advancing the state of the art in the ultrasonic inspection of adhesive bonds. A computer program was developed with the capability of calculating the theoretical longitudinal and shear reflections from a homogeneous isotropic adhesion bond due to an obliquely incident longitudinal wave. A fast data acquisition system consisting of a PDP 11/05 minicomputer, Biomation 8100 A/D converter and a Tektronix 4014 graphics display was also developed. Attention is now being placed on examining the ultrasonic in-

spection potential of additional metal to metal adhesive bonds, and separately, the examination of selected composite materials, the procedures of which use basic concepts presented in this report.

AD-A027 711/1GA PC$4.00/MF$3.00
Calspan Corp Buffalo N Y
Wall Interference Effects in Transonic Flows.
Final rept. 15 Jan 71-31 Dec 75,
R. J. Vidal. 1976, 37p CALSPAN-AE-3059-A-1, AFOSR-TR-76-0770
Contract F44620-71-C-0046

Descriptors: *Transonic wind tunnels, *Walls, Porous materials, Ventilation, Theory, Interference, Mathematical prediction, Reliability, Experimental data, Pressure gradients, Shock waves, Turbulent boundary layer, Test methods, Test equipment, Reynolds number, Flow separation, Transonic characteristics.
Identifiers: *Wall interference, Shock wave interactions, Ludwieg tubes, Porous walls.

This report reviews the research accomplished in two sections. The first describes existing theories for predicting wall interference effects in wind tunnels with ventilated test sections to demonstrate that the existing knowledge of the wall boundary conditions precludes the application of these theories. Experimental data and theory are presented to criterize the accepted wall boundary condition for a porous wall. The second section summarizes some experimental research on transonic shock wave-turbulent boundary layer interactions and provides references to the results that have been documented.

AD-B007 946/7GA PC$9.25/MF$3.00
Grumman Aerospace Corp Bethpage N Y
Evaluation of Environmental Profiles for Reliability Demonstration.
Final technical rept. Jun 73-Jan 75,
George Hirschberger, and Allan Dantowitz. Sep 75, 267p RMS-75-R-3, RADC-TR-75-242
Contract F30602-73-C-0317
Distribution limitation now removed.

Descriptors: (*Specifications, Deficiencies), Reliability, Profiles, (*Environmental tests, Proficiency), Avionics, Weapon systems, Thermal cycling tests, Vibration, Shock resistance, Moisture.
Identifiers: *Military specifications, *Environmental specifications, Inadequacy.

This report describes the results of a 19-month study to determine the adequacy of the environmental profiles of MIL-STD-781, 'Reliability Tests: Exponential Distribution,' and provide recommendations for their improvement. The environmental and failure history of a sample of 95 avionic weapons replaceable assemblies (WRAs) served as the vehicle for this evaluation. Environmental data during demonstration testing and actual field exposure for each WRA was collected, analyzed, and compared. Test failure history and field failure experience were reviewed and reliability measures for each determined. Comparisons of lab-field reliability differences with environmental differences indicated that: insufficient thermal cycling; inadequate vibration testing in terms of level, duration and frequency; and lack of moisture exposures were deficiencies in the current environmental profiles. Recommended profiles which would eliminate these weaknesses are presented. In addition, the need for consistent ground rules, failure scoring criteria, and a strong end-item burn-in test are described. (Author)

N76-25149/5GA PC$4.00/MF$3.00
Weapons Research Establishment, Salisbury (Australia).
The Application of Bessel Filters to the Measurement of the Roll Rate and Roll Acceleration of a Rotating Body.
I. C. Heron, and R. E. Kane. Oct 75, 28p WRE-TN-1501(WR/D)

Descriptors: Bessel functions, Digital filters, *Lateral control, *Tachometers, Computer techniques, Rolling moments, Sampling, Wind tunnel models.
Identifiers: Australia, Fourier analysis.

For abstract, see STAR 1416

N76-25266/7GA PC$11.00/MF$3.00
Advisory Group for Aerospace Research and Development, Paris (France).
Flight/Ground Testing Facilities Correlation.
Apr 76, 417p AGARD-CP-187, ISBN-92-835-0163-2
Conf-Presented at 46TH Meeting of the Flight Mech. Panel, Valloire, France, 9-13 Jun. 1975.

Descriptors: Conferences, *Flight tests, *Wind tunnel tests, Aerodynamic characteristics, Data correlation, Noise (Sound), Reynolds number, Transonic wind tunnels.
Identifiers: France.

For abstract, see STAR 1416

N76-25444/0GA PC$3.50/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Demonstration of the Frequency Offset Errors Introduced by an Incorrect Setting of the Zeeman/Magnetic Field Adjustment on the Cesium Beam Frequency Standard.
D. C. Kaufmann. May 76, 13p NASA-TM-X-71122, X-814-76-100

Descriptors: *Cesium, *Frequency measurement, *Frequency standards, *Zeeman effect, Calibrating, Magnetic fields, Measuring instruments.

For abstract, see STAR 1416

N76-25979/5GA PC$4.50/MF$3.00
Rensselaer Polytechnic Inst. of Connecticut, Inc., East Windsor Hill.
Investigation of a Quadrupole Ultra-High Vacuum Ion Pump.
Final Report, Mar. 1969 - 31 Aug. 1974.
H. J. Schwarz. Aug 74, 65p NASA-CR-145010
Contract NGL-07-009-003

Descriptors: *Ion pumps, *Ionization gages, *Quadrupoles, *Ultrahigh vacuum, Electrodes, Hot cathodes, Magnetic pumping, Radio frequencies.

For abstract, see STAR 1416

PAT-APPL-631 281/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
Testing Apparatus for Incremental Shaft Encoder.
Patent Application,
Thomas Kazangey. Filed 12 Nov 75, 14p AD-D002 616/1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Coders, Instrumentation, Increments, Transducers, Angular motion, Test methods.
Identifiers: *Incremental shaft encoders, *Patent applications, PAT-CL-324-160.

The patent application describes an apparatus for testing an incremental shaft encoder in which the encoder is placed upon a rate table together with a gyroscope to permit coincident rotation. Every time the shaft of the incremental shaft encoder turns through a complete cycle, the leading edges of a square wave output generated by the encoder, start and stop a counter which is fed by a frequency signal derived from the rotating gyroscope through a voltage-to-frequency converter. The counter output then is applied to a printer.

PAT-APPL-673 180/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Acousto-Optical Transducer.
Patent Application,
Peter Shajenko. Filed 2 Apr 76, 12p AD-D002 597/3
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Acoustooptics, *Transducers, Surface waves, Laser modulators, Data processing, Laser beams, Mirrors, Acoustic waves, Surface waves, Optical communications, Signal processing.
Identifiers: Acoustic surface waves, PAT-CL-350-161, *Patent applications, Optical modulators, *Acoustooptic transducers.

The patent application relates to acoustic transducers and more particularly to an acousto-optical transducer which uses a laser beam incident upon a pair of parallel mirrors which move under the influence of acoustic pressure waves in a medium such as water. The transducer comprises a pair of mirrors of high reflectivity arranged in parallel to form an etalon. The etalon so formed is housed in a water tight housing and a laser beam is allowed to enter the housing at a small angle of incidence into the etalon. After suffering many reflections at the etalon mirrors, the laser beam is made to come out of the housing. The reflected beam experiences a frequency shift as the acoustic pressure waves imparts motion to the etalon mirrors. The reflected laser beam is then used to beat with a light of a fixed frequency by using an heterodyne technique. The data obtained are originally in an optical form and the application of various data processing techniques, such as optical, digital or analog techniques is possible.

PAT-APPL-681 984/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Capacitance Transducer for the Measurement of Bending Strains at Elevated Temperatures.
Patent Application,
Hugh H. Smith, David J. Michel, and Paul Shahinian. Filed 30 Apr 76, 10p AD-D002 612/0
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Strain gages, Transducers, Capacitance, Bending, High temperature, Strain(Mechanics), Measurement, Detectors.
Identifiers: *Patent applications, PAT-CL-73-88.5.

The patent application relates to a capacitance type transducer used for the measurement of bending strains in test elements which are not sufficiently strong to support a strain element or for test elements in which a strain element would strengthen the test element and not give an accurate test. The transducer is formed by a spring wire which has a portion perpendicular to the test specimen with a U-shaped end extending from the perpendicular portion. One portion of the U-bend has an insulator about the wire where the insulator parallels the test specimen surface and is in contact therewith. The end of the wire has a flat conductive plate secured thereto with the flat plate parallel with the specimen. The spacing between the flat plate and the specimen forms the capacitance spacing which changes as the specimen is

strained in a direction perpendicular to the flat plate.

PAT-APPL-688 515/GA PC$3.50/MF$3.00
Department of the Interior, Washington, D.C.
Dosimeter for Oxides of Nitrogen.
Patent Application,
Benjamin Ferber, Frederick A. Sharp, and Robert W. Freedman. Filed 20 May 76, 25p PB-255 383/2, DOCKET/MIN-2513
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Nitrogen oxides, *Dosimeters, *Mine gases, Accuracy, Measuring instruments, Membranes, Field tests.
Identifiers: Indoor air pollution.

This patent application pertains to a dosimeter for the determination of integrated exposures to NO, NO2 or exposures to both gases. The dosimeter provides for a convenient and accurate method for the determination of exposures which may be encountered by workers or miners in field environments.

PAT-APPL-688 657/GA PC$3.50/MF$3.00
Department of the Interior, Washington, D.C.
Deductive Method for Measuring Ion Concentration Electrically.
Patent Application,
Carl Lee Blanchard. Filed 21 May 76, 12p PB-255 384/0, DOCKET/SUR-2413
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Ions, *Concentration(Composition), Electrical resistivity, pH, Solutions, Measurements, Electrochemistry, Electrodes.

This patent application relates to a deductive analytical method, using measurements of specific conductivity and pH, for determining the concentration of a desired ion in a sample which may contain multiple ionic species without removal of the ions from solution. The method involves the steps of: measuring the specific conductivity and the pH of the sample and of a reagent; adding an excess of the reagent capable of reacting with the desired ion, e.g. causing precipitation, thereby reducing the specific conductivity of the sample; measuring the pH and specific conductivity of the sample-reagent mixture; comparing the pH and specific conductivity values of the sample, the reagent and the reaction product of the sample and reagent; and deducing the concentration of the measured ion from these values by calculation. This method permits measurement of an ionic species by a simple rapid technique which utilizes measurements on simple equipment and avoids the more complex and time-consuming operations of separation and weighing used in the prior art.

PAT-APPL-694 396/GA PC$3.50/MF$3.00
Department of Health, Education, and Welfare, Washington, D.C.
Dialysis Solution Handling Device.
Patent Application,
Calvin A. Saravis. Filed 9 Jun 76, 11p PB-255 480/6, DHEW-K-134-75
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Dialysis, *Materials handling equipment, Solutions, Radioactive materials, Laboratory equipment, Sterility, Infectious diseases, Safety, Design criteria, Performance evaluation.

This patent application pertains to a handling device for enabling a technician to dialyze a solution without direct contact with the solution to be dialyzed. The device comprises a polycarbonate rod having an internal bore and a test tube gripping element at one end. At the other end is clamped a section of dialysis tubing, there being a passageway from the test tube-gripping end through the internal bore and into the dialysis tubing. The dialysis tubing is knotted to form a dialysis bag. The rod is manipulated to grippingly engage over a test tube containing the solution to be dialyzed and the test tube is inverted to transfer its contents to the dialysis bag, after which the device is supported in inverted position with the bag in a dialysis bath. After dialysis, the device is removed and reversed, returning the dialyzed solution to the test tube.

PATENT-3 921 174 Not available NTIS
Department of the Navy Washington D C
Digital Tracking Range Unit.
Patent,
Robert D. Isaak, and Woodrow H. Littrell. Filed 20 Dec 63, patented 18 Nov 75, 9p AD-D002 638/5, PAT-APPL-333 267
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Range finding, *Tracking, *Patents, Digital systems, Correlation techniques, Pseudo noise systems, Pseudo random systems, Comparators.
Identifiers: PAT-CL-343-112.

The patent relates to a digital tracking range unit using (passive) correllation techniques. A pseudo-random noise signal is generated and transmitted by the station or object from which the range is to be determined. This signal is received at the range tracking station and passed to a signal comparator unit which correlates this signal with a self-generated signal of the same pattern. If the two signals are coincident in time an output will result from the correlator.

PATENT-3 925 733 Not available NTIS
Department of the Navy Washington D C
Maximum Pulse Density Detector.
Patent,
Wayne E. Moore. Filed 24 May 74, patented 9 Dec 75, 7p AD-D002 640/1, PAT-APPL-473 049
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Detectors, *Trigger circuits, *Patents, Pulse trains, Density, Synchronization(Electronics).
Identifiers: PAT-CL-328-140.

The patent relates to an improved electronic circuit and technique for providing a trigger pulse synchronized with the maximum pulse density in a random pulse train. A frequency modulated pulse train having uniform amplitude pulses is delivered to an RC circuit which provides an output waveform having maximum amplitude at the highest input frequency or maximum pulse density. The waveform is passed through a smoothing filter and amplifier to more particularly define the waveform peak, and then to a peak detector where the point of maximum amplitude is sensed using a transistor sensing circuit. A pulse output from the transistor sensing circuit is electronically modified to produce an impulse trigger spike that corresponds to the point of maximum pulse density over a wide range of input conditions.

PATENT-3 966 981 Not available NTIS
Department of Agriculture, Washington, D.C.
Process for Removing Residual Solvents.
Patent,
William G. Schultz. Filed 26 Nov 74, patented 29 Jun 76, 3p PB-255 481/4, PAT-APPL-527 402
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Materials recovery, Separation, Food processing, Organic solvents, Extraction, Carbon dioxide.
Identifiers: PAT-CL-426-425.

This patent pertains to a process for removing residual solvent from materials containing the same which involves extracting the material with liquid CO2, separating the phases, and evaporating CO2 from the treated material. For example, residual hexane can be removed from de-fatted soybeans by this procedure.

PB-252 788/4GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Electronic Technology Div.
Laser Scanning of MOS IC's Reveals Internal Logic States Nondestructively.
Final rept.,
David E. Sawyer, and David W. Berning. 25 Aug 75, 3p
ARPA Order-2397
Pub. in Proceedings of IEEE Letters, v64 n3 p393-394 Mar 76.

Descriptors: *Nondestructive tests, *Integrated circuits, *Lasers, Scanning, Metal oxide semiconductor, Shift registers, Helium neon lasers, Logical elements, Reprints.

A laser scanning system has been used to observe the internal logic pattern in a MOS LSI device in a non-destructive manner. The laser scanner has also been used to selectively change logic states deep within the device. Pictures of the logic patterns revealed by the scanner are discussed. Copyright (c) 1976, the Institute of Electrical and Electronic Engineers, Inc.

PB-255 093/7GA PC$5.00/MF$3.00
Meteorology Research, Inc., Altadena, Calif.
Optical Method for Measuring the Mass Concentration of Particulate Emissions.
Final rept.,
Gregory R. Markowski, George J. Woffinden, and David S. Ensor. Mar 76, 96p MRI75-FR-1379, EPA/600/2-76/062
Contract EPA-68-02-1749

Descriptors: *Particles, *Optical measuring instruments, Laboratory equipment, Light scattering, Concentration(Composition), Aerosols, Particle size, Air pollution, Refractivity, Performance evaluation, Transmissometers, Monitoring, Weight(Mass).
Identifiers: Stationary sources, *Air pollution detection, *Scatometers.

The objective of this study is to demonstrate the feasibility of an in-situ across-the-stack optical technique to measure the mass of particulate emissions from stationary sources. The technique uses small angle light scattering and transmittance to determine a quantity closely related to particulate mass concentration. The forward scattered light is measured at an angle of 1 deg or less. The technique has been investigated both theoretically using Mie theory, and experimentally using aerosols produced in the laboratory. The experimental results agree with the theoretical predictions and indicate that the method is relatively insensitive to changes in aerosol parameters such as particle size, refractive index, and shape.

PB-255 195/0GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Ultrasonic Measurements at Pressures Up to 50 kbar.
Final rept.,
P. L. M. Heydeman. 1970, 9p
Pub. in Proceedings of Internationaux Colloques Les Proprietes Physiques des Solides Sous Pression, Grenoble, France, September 8-10, 1969, n188 p461-467 (Centre National de la Recherche Scientifique, Paris, France, 1970).

Descriptors: *Ultrasonic tests, *Elastic properties, *Density(Mass/volume), Bulk modulus, Equations of state, Phase transformations, Pressure, Temperature, Tellurium, Potassium chloride, Specific heat.

Ultrasonic measurements as a function of pressure or temperature provide one of the most accurate means to determine pressure or temperature dependence of the bulk modulus and the density of both liquids and solids. If the material under investigation undergoes transitions at higher pressures, or if the bulk modulus is noticeably non-linear with pressure, ultrasonic measurements at pressures higher than 4 kbar are needed. This report describes our methods to carry out such measurements at pressures close to 50 kbar, both under hydrostatic and non-hydrostatic conditions. For most materials the accuracy of the density and bulk modulus data obtained from such measurements is much higher than that obtained from isothermal dilatometric measurements. In the case of tellurium, the accuracies for the bulk modulus at 30 kbar are 1.6% and 23%, respectively. Another interesting application of ultrasonics at high pressures is the detection of phase transitions and the measurement of the elastic properties as the material undergoes the transition. As an example for measurements through a transition range, results of ultrasonic and isothermal dilatometric measurements on KCl are presented. It was found that the ratio of specific heats also shows a sharp increase in the transition range.

PB-255 204/0GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Improved Microwave-Discharge Source for UV Photoemission.
Final rept.,
T. V. Vorburger, B. J. Waclawski, and D. R. Sandstrom. 19 Aug 75, 5p
Sponsored in part by Office of Naval Research, Arlington, Va. Pub. in Rev. Sci. Instrum., v47 n4 p501-504 1976.

Descriptors: *Ultraviolet spectroscopy, *Photoelectric emission, *Chemisorption, Performance evaluation, Molecular energy levels, Photons, Design criteria, Laboratory equipment, Cyclotron resonance, Fermi surfaces, Tungsten, Carbon monoxide.
Identifiers: Reprints.

A microwave-discharge uv light source has been improved to yield significant photon fluxes at 26.9 and 40.81 eV. In order to optimize the 26.9-eV (NeII) and 40.81-eV (HeII) radiation, the discharge was operated at approximately 2.5 Pa (0.019 Torr) in an external constant magnetic field of approximately 0.070 T (700 G), which, together with the oscillating electric field of the cavity, produces electron cyclotron resonance. When the discharge conditions were optimized for production of 40.81-eV photons, features near the Fermi energy in the photoemission distribution from W(100) for 40.81-eV photons are approximately 6% as intense as the corresponding features in the distribution for 21.22-eV photons. We estimate that under these conditions the flux of 40.81-eV photons is roughly 50% of the flux of 21.22-eV photons. Photoemission energy distributions with h(nu)=16.85, 21.22, 26.9, and 40.81 eV have been measured for saturated exposures of CO on W(100) at a temperature of approximately 80 K. The variation in these data with photon energy is important for making orbital assignments to the energy levels of adsorbed molecular CO.

PB-255 209/9GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Review of the CIE Photometric Model and of the Status of Radiometric Measurements.
Final rept.,
Bruce W. Steiner. 1976, 11p
Pub. in Proceedings of Symp. on The Basis for Effective Management of Lighting Energy, Washington, D.C. Oct. 29-30, 1976, p185-195 (Federal Energy Administration, Washington, D.C., 1976).

Descriptors: *Photometry, *Radiometry, Models, Measurement, Reviews.

The paper reviews the status of the CIE photometric model and of radiometric measurements. The CIE photometric model universally used for heterochromatic photometry is an additive model, in contrast to the behavior of the eye in viewing large areas. Although this additivity is not valid visually, the practical advantages of such a system until now have outweighed the disadvantages. This situation should be reexamined. Moreover, the most careful spectral measurements now show a 2 percent spread in the visible, comparable to the best photometric measurements. Although routine commercial measurements cannot yet be expected to achieve this level of agreement, this goal for the future now seems realistic. On this basis, a more visually realistic photometry now seems to be the practical goal.

PB-255 234/7GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Controlled Environments for Meaningful Measurement.
Final rept.,
Robert S. Walleigh. Jan 69, 8p
Pub. in Research/Development, v20 n1 p16-21 Jan 69.

Descriptors: *Controlled atmospheres, Measurement, Test facilities, Laboratories.
Identifiers: Reprints.

Highlights are presented showing how NBS goes to great lengths to apply architectural planning concepts as well as control measures involving special equipment, materials, and techniques in order to achieve optimum laboratory environments for its measurement operations. The significance of comprehensive knowledge and control of conditions such as temperature, light, electrical current, gravity, vibration, pressure, etc., for the Bureau's service to U.S. science and technology in a time of rapid change, is discussed.

PB-255 411/1GA PC$4.00
Wisconsin Univ., Madison. Marine Studies Center.
Comparison of Thermal Scanning and In Situ Techniques for Monitoring Thermal Discharges.
Gary J. Marmer, John V. Tokar, and Robert P. Madding. Dec 75, 26p WIS-SG-76-358, NOAA-76040604
Prepared in cooperation with Argonne National Lab., Ill. Pub. in Water Resources Bulletin (American Water Resources Association), v11 n6 p1157-1180 Dec 75. (Paper 75061).

Descriptors: *Nuclear power plants, *Plume detection, *Thermal pollution, *Infrared detection, Thermal measurements, Temperature measuring instruments, Remote sensing, Monitors, Infrared scanners, Lake Michigan.
Identifiers: Water pollution sampling, Water pollution detection, Point Beach Nuclear Power plant, Sea Grant Program, Reprints.

In situ and remote sensing techniques for measuring thermal plumes are compared for data taken at the Point Beach Nuclear Power Plant on Lake Michigan for five separate occasions. The in situ method employed a boat whose position was determined with a microwave ranging system. Temperatures at the surface and at various depths were measured with fast response thermistor probes. The remote sensing technique used an infrared scanner in the 8 to 14 micrometer range. The inherent advantages and disadvantages of each method are discussed in light of the results of the five sets of data. This includes both the data collecting and data analyzing procedures. It is concluded that judicious combination of both methods offers a better picture of thermal plumes that can be obtained by either technique alone.

PB-255 436/8GA PC$4.00/MF$3.00
California State Dept. of Transportation, Sacramento. Transportation Lab.
Concrete Aggregate Durability Tests.
Final rept.,
D. L. Spellman, J. H. Woodstrom, and S. N. Bailey. Dec 75, 45p CA-DOT-TL-3476-2-75-44, 633476
Prepared in cooperation with Federal Highway Administration, Washington, D.C.

Descriptors: *Aggregates, *Concrete durability, *Quality control, Sodium sulfates, Elastic properties, Autoclaving, Tests, Density(Mass/volume).

Several procedures are studied in an attempt to develop a less time consuming substitute for the sodium sulfate soundness test. Considered were procedures using elastic fractionation, heavy media separation, autoclave degradation, freezing and thawing of aggregates, and others. One procedure, detrition value test, correlates fairly well with soundness test losses for aggregates from one area of the state where the soundness test is a controlling factor in aggregate processing. This procedure consists of the dynamic abrasion of water and aggregate in a 5 gallon bucket on a paint shaker. A test method was developed and an alternate specification to the soundness test requirement written for control of aggregate quality. The specification is currently limited to aggregates from the Santa Clara River area near Ventura.

PB-255 505/0GA PC$4.00/MF$3.00
National Bureau of Standards, Washington, D.C. Inst. for Basic Standards.
Environmental Effects on Microphones of Various Constructions.
Final rept. Mar-Jun 75,
Gale R. Hruska, Edward B. Magrab, and William B. Penzes. Jul 76, 36p NBSIR-76-1090, EPA/550/9-76-009

Descriptors: *Microphones, Acoustic measurement, Calibrating, Electrets, Ceramics, Capacitors, Sensitivity, Humidity, Temperature, Environmental tests, Stability.

The pressure sensitivities of two 1/2-inch electret, two 1-inch ceramic, and two backvented 1-inch condenser microphones were measured for numerous combinations of temperature, percentage relative humidity, and frequency. The two condenser microphones were calibrated by the reciprocity technique at each combination of temperature, relative humidity and frequency. The condenser microphones were then used as calibrated sources to determine the pressure sensitivities of the other microphones. Insert voltage techniques were used to eliminate the environmental effects on the electronics. It was found

that the back-vented condenser microphones are insensitive to changes in relative humidity. At frequencies considerably below their resonance frequencies they exhibited only a very small change in sensitivity with temperature. At frequencies closer to the resonance frequency the temperature coefficient increases approximately fourfold. The temperature and humidity coefficient for the electret and ceramic microphones could not be determined due to the instability in their sensitivities which produced changes that were larger than those induced by the temperatures and humidities.

PB-255 528/2GA Not available NTIS
Scripps Institution of Oceanography, La Jolla, Calif.
Chlorinated Hydrocarbons in Seawater: Analytical Method and Levels in the Northeastern Pacific,
Edward D. Scura, and Vance E. McClure. 25 Nov 74, 11p NSF/IDOE-76-69
Grant NSF-GX-32977
Prepared in cooperation with National Marine Fisheries Service, La Jolla, Calif. Southwest Fisheries Center.
Pub. in Marine Chemistry, v3 p337-346 1975.

Descriptors: *Water analysis, *Chlorine organic compounds, *Chlorohydrocarbons, Diphenyls, Marine atmosphere, Sea water, Water pollution, Gas chromatography, North Pacific Ocean, Pesticides, DDT, Adsorbents, Concentration(Composition).
Identifiers: Reprints, *Water pollution detection, Biphenyl/chloro, International Decade of Ocean Exploration.

A method is described for analyzing nanogram quantities of chlorinated hydrocarbons from 1-1 samples of seawater. Seawater samples are pumped through a copper column containing a mixture by weight of 5 percent activated carbon powder, 10 percent MgO and 85 percent refined diatomaceous earth. The chlorinated hydrocarbons in the seawater are absorbed or trapped on the column and subsequently eluted with 30 percent benzene in acetone (v/v) for analysis by gas-liquid chromatography. This procedure was used to analyze chlorinated hydrocarbon levels in samples collected off the southern California coast. The authors suggest that anthropogenic chlorinated hydrocarbons can be used for investigation of large-scale ocean currents and mixing processes.

PB-255 539/9GA PC$4.00/MF$3.00
National Bureau of Standards, Washington, D.C. Inst. for Basic Standards.
Modification of an NBS Reference Spectrophotometer.
Final rept.,
Kenneth L. Eckerle. Jul 76, 46p NBS-TN-913

Descriptors: *Spectrophotometers, *Instrumentation, *Ultraviolet spectrometers, Design criteria, Ultraviolet optical materials, Coatings, Visible spectrum, Performance evaluation, Efficiency, Laboratory equipment, Sensitivity, Data processing, Calibrating.
Identifiers: Averaging spheres.

The description of a new reference spectrophotometer capable of making transmittance measurements accurate to 0.0001 transmittance units has already been reported. The purpose of this publication is to describe some modifications that have been made to this instrument and to report some further measurements performed with it. The extension of the range of the instrument down to 200 nm, providing a capability for making measurements over the spectral range 200 to 800 nm, is outlined, and extensive testing of the light averaging effectiveness of several types of devices and spheres is reported.

PB-255 803/9GA PC$5.50/MF$3.00
National Bureau of Standards, Washington, D.C. Office of International Relations.
Report to AID on a Philippines Survey on Standardization and Measurement Services.
Final rept.,
H. Steffen Peiser, and Robert S. Marvin. Jun 76, 124p NBSIR-76-1083
Prepared in cooperation with Agency for International Development, Washington, D.C.

Descriptors: *Regional planning, *Philippines, *Services, Standardization, Measurement, Surveys, International relations, Metric system, Technology, Construction, Developing countries, Test facilities, Information systems, Government policies, Organizations, Schools, Recommendations, Problem solving.
Identifiers: Metrication, Building technology.

A survey of standardization and measurement services in the Philippines was carried out in by a survey team May, 1975, as part of a National Bureau of Standards program sponsored by the Office of Science and Technology of the Agency for International Development. The team was divided into five groups which concentrated on: technical standards management, metrication, building technology, technical information handling, and testing facilities. Each group made extensive visits to the governmental, academic, and private organizations and facilities relevant to their topic. In each area the report summarizes the existing situation, identifies current problems, and offers suggestions and recommendations for their resolution.

PB-255 809/6GA PC$4.50/MF$3.00
National Bureau of Standards, Washington, D.C. Inst. for Basic Standards.
The National Measurement System for Surface Finish.
Final rept.,
Russell D. Young. Mar 76, 51p NBSIR-75-927

Descriptors: *Surface finishing, *Standards, Measurement, Finishes, Surfaces, Surface roughness, Economic impact, Trends.

NBS has conducted a study of the National Measurement System for Surface Finish. The proposed system model is discussed including the role of standards committees, instrument manufacturers and measurement users. The economic dimensions of the measurements impact areas and the technological base from which new measurement technology springs is described.

14D. Reliability

AD-A027 370/6GA PC$8.00/MF$3.00
Army Materiel Command Alexandria Va
Engineering Design Handbook. Development Guide for Reliability. Part Two. Design for Reliability.
Jan 76, 242p Rept no. AMCP-706-196
See also Part 4, AD-A027 371.

Descriptors: *Reliability, Systems engineering, *Handbooks, Reliability(Electronics), Army equipment, Life cycles, Standards, Test methods, Environmental tests, Scheduling, Checkout procedures, Human factors engineering, Failure, Concept formation, Measurement, Data banks, Optimization.
Identifiers: *Engineering design, Design.

This handbook is directed toward reliability engineers who need to be familiar with the mathematical-probabilistic-statistical techniques for predicting the reliability of various configurations of hardware. The material in standard textbooks is not repeated here; the important points are summarized, and references are given to the standard works.

AD-A027 371/4GA PC$9.25/MF$3.00
Army Materiel Command Alexandria Va
Engineering Design Handbook. Development Guide for Reliability. Part Four. Reliability Measurement.
Jan 76, 296p Rept no. AMCP-706-198
See also Part 6, AD-A027 372.

Descriptors: *Reliability, Systems engineering, *Handbooks, Reliability(Electronics), Army equipment, Life cycles, Standards, Test methods, Environmental tests, Scheduling, Checkout procedures, Concept formation, Measurement, Human factors engineering, Test equipment, Nondestructive testing, Accelerated testing, Management planning and control, Optimization.
Identifiers: *Engineering design, Design.

Reliability measurement techniques provide a common discipline that can be used to make system reliability projections throughout the life cycle of a system. The data on component and equipment failures obtained during the reliability measurement program can be used to compute component failure distributions and equipment reliability characteristics. Reliability measurement techniques are used during the research and development phase to measure the reliability of components and equipments and to evaluate the relationships between applied stresses and environments and reliability. Later in a system life cycle, reliability measurement and testing procedures can be used to demonstrate that contractually required reliability levels have been met.

AD-A027 372/2GA PC$5.50/MF$3.00
Army Materiel Command Alexandria Va
Engineering Design Handbook. Development Guide for Reliability. Part Six. Mathematical Appendix and Glossary.
Jan 76, 101p Rept no. AMCP-706-200
See also Part 2, AD-A027 370.

Descriptors: *Reliability, Systems engineering, *Handbooks, Reliability(Electronics), Optimization, Test methods, Concept formation, Decision theory, Mathematical analysis, Distribution functions, Binomials, Poisson density functions, Exponential functions, Weibull density functions, Logarithm functions, Bayes theorem, Sampling, Tables(Data).
Identifiers: *Engineering design, Design, Gaussian distribution, Beta distribution, Gamma distribution, Goodness of fit tests.

Contents: Probability Distributions, Some Cautions and Names; Binomial Distribution; Poisson Distribution; Gaussian (s-Normal) Distribution; Probability Distributions Derived from the Gaussian Distribution; Exponential Distribution; Weibull Distribution; Lognormal Distribution; Beta Distribution; Gamma Distribution; Confidence; Plotting Positions; Goodness-of-fit Tests; Tests for Monotonic; Bayesian Statistics; Sampling Plans; and Miscellaneous Design Aids.

AD-A027 722/8GA PC$3.50/MF$3.00
North Carolina Univ At Charlotte Dept of Mathematics
Optimal Replacement Policies for Devices Subject to a Gamma Wear Process.
Technical rept.,
M. Abdel-Hameed. Jun 76, 21p TR-1, AFOSR-TR-76-0771
Grant AF-AFOSR-2999-76

Descriptors: *Reliability, *Replacement theory, Mathematical models, Statistical analysis, Distribution functions, Theorems.
Identifiers: Gamma function, Failure rate functions.

Suppose that a device is subject to wear occurring randomly in time as a gamma process the set (X(t), t > or = 0). Let zeta be the life length of

the device. The device can be replaced before or at failure. In this paper the author gives a form of an optimal replacement policy that minimizes the expected replacement cost per unit time. Discrete version of the above results is also considered.

PB-256 107/5GA PC$4.00/MF$3.00
Environmental Monitoring and Support Lab., Las Vegas, Nev. Monitoring Systems Research and Development Div.
The Status and Quality of Radiation Measurements of Water.
Interim rept. 1974,
A. N. Jarvis, R. F. Smiecinski, and D. G. Easterly. Apr 76, 30p EPA-600/4-76-017

Descriptors: *Radioactive isotopes, *Water analysis, *Quality assurance, Water pollution, Public health, Radium isotopes, Tritium, Chromium isotopes, Cobalt 60, Zinc 65, Ruthenium isotopes, Cesium 134, Cesium 137, Histograms, Samples, Water quality.
Identifiers: Radium 226, Chromium 51, Ruthenium 106, Laboratory tests.

As part of the radiation quality assurance program conducted by the U.S. Environmental Protection Agency, calibrated radionuclide solutions are distributed to participating laboratories for instrument calibration and yield determinations. Laboratory performance studies involving the analysis of radionuclides in environmental media are also conducted. A summary is given of the results of the water cross-check program for 1974. Examination of these results reveals that gross beta is the most difficult (44 percent within the control limits) and tritium is the least difficult (90 percent within the control limits) for the laboratories to analyze. These results indicate the need for improvement in analytical procedures for the radionuclide studies.

14E. Reprography

AD-A027 219/5GA PC$3.50/MF$3.00
Environmental Research Inst of Michigan Ann Arbor
Optimum Discrimination Using High Gamma Aerial Color Photography by Exposure Control,
G. Suits. 21 May 76, 15p

Descriptors: *Aerial photography, *Gamma ray spectra, *Surface targets, *Color photography, Target recognition, Background, Target discrimination, Spectrum analysis, Variations, Photographic reconnaissance, Remote detectors.
Identifiers: Gamma ray photography, Spectral variations, *Photographic exposure, Exposure control, Incident radiation.

An important application of aerial photography in remote sensing is the detection and discrimination of small changes in the spectral quality of objects or regions of interest from the spectral quality of the normal background. In particular, diseased areas of agricultural crops and forests, small stands of different species in forests, and water pollution all tend to exhibit small spectral variations indicative of the presence of important objects or conditions of interest. However, normally exposed, high gamma color photography frequently fails to record these conditions in an optimum fashion. In the following paragraphs, a systematic method of optimizing the discrimination by aerial photography is developed. Simple and cogent rules of thumb are derived for exposure control of high gamma color aerial photography for optimizing the discrimination of certain classes of background materials from target areas whose spectral properties are very close to those of the background. The logic for deriving the optimization procedure by exposure control makes use of the concepts of exposure magnitude and direction of color film. These two new concepts are described below. (Author)

N76-25538/9GA PC$3.50/MF$3.00
Perkin-Elmer Corp., Pomona, Calif. Aerospace Div.
Development of a Drive System for a Sequential Space Camera.
Final Report.
J. T. Sharpsteen, C. D. Solheim, and L. J. Stoap. May 76, 16p NASA-CR-147759, SPO-30352-ADD Contract NAS9-14573

Descriptors: *Cameras, *Electric motors, *Spaceborne photography, Breadboard models, Camera shutters, Commutation, Magazines (Supply chambers), Performance tests.

For abstract, see STAR 1416

PAT-APPL-678 323/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
Vapor Concentration Control System for Vapor Diazo Processors.
Patent Application,
Walter K. Bordett. Filed 19 Apr 76, 8p AD-D002 620/3
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Gas detectors, *Infrared equipment, *Vapor phases, Concentration(Composition), Instrumentation, Photographic processing, Diazo compounds, Automation.
Identifiers: PAT-CL-96-49, *Patent applications, Design criteria.

This patent application pertains to a vapor concentration control apparatus using IR frequencies to sense the vapor concentration available for the processing of diazotype photo prints.

15. MILITARY SCIENCES

15C. Defense

AD-A027 249/2GA PC$4.50/MF$3.00
Naval Postgraduate School Monterey Calif
Small Independent Action Force (SIAF), Vegetation Classification Study.
Master's thesis,
Wayne Everette Deutscher. Mar 76, 62p

Descriptors: *Vegetation, *Camouflage, *Combat surveillance, Classification, Grasses, Brushes, Trees, Tactical warfare, Computerized simulation, War games, Models, Terrain, Theses.
Identifiers: Small independent action forces, SIAF(Small Independent Action Forces).

This study was conducted to examine the Small Independent Action Force (SIAF) Model's vegetation classification scheme. The SIAF Model has as its basis an ordinal scale based upon density and type of vegetation. An interval scale based upon individual judgments was established which did not correlate with the model's scale in two instances. SIAF Class 6 was judged more difficult than SIAF Class 4. An attempt was made to determine how well an individual could determine the classification of a scene utilizing the existing SIAF classes. Results indicated that individuals attained a correct response of 43.6%. It was also determined that there was negative intraclass correlation using the Intraclass Correlation Coefficient. No prediction can be made as to how an individual would respond to identical stimuli. There was found to be no learning effect by the subjects in determining correct SIAF Class discrimination. (Author)

AD-A027 602/2GA PC$6.00/MF$3.00
General Electric Co Philadelphia Pa Re-Entry and Environmental Systems Div
Availability Evaluation Program Manual.
1 Jan 70, 146p NAVORD-OD-43251
Contracts N00030-68-C-0215, N00030-69-C-0082
Errata sheet inserted.

Descriptors: *Weapon systems, Reliability, *Systems management, *Instruction manuals, Assessment, Quality assurance, Maintainability, Measurement, Effectiveness, Readiness, Standards, Fleets(Ships), Systems engineering, Computer programs.
Identifiers: *Availability evaluation program manual, Evaluation, Pilot production.

NAVORD OD 43251 is a comprehensive practical guide to evaluating the availability of major weapon system or subsystems during development. This manual integrates various technological concepts and disciplines (viz. reliability, maintainability, engineering analysis, etc.) into a unified program with the ultimate objective of providing a feasible method for evaluating and assessing availability measures. NAVORD OD 43251, 'Availability Evaluation Program Manual' was developed as a companion document to NAVWEPS OD 29304, Guide Manual for Reliability Measurement Program,' for the implementation of MIL-Q-21549, 'Product Quality Program Requirements for Fleet Ballistic Weapon System Contractors'. Together they formulate a partial means for assessing System Effectiveness during development. The terminology and definitions utilized in this manual are in consonance with DOD policy and current military standards and specifications.

AD-B009 730/3GA PC$3.50/MF$3.00
Aberdeen Proving Ground MD Materiel Testing Directorate
Special Study of Gunnery Practice using Targets Towed by Manned Aircraft.
Final letter rept. 17 Dec 75-20 Feb 76,
Larry D. Brugh. Feb 76, 17p Rept no. APG-MT-4764
Distribution limitation now removed.

Descriptors: (*Antiaircraft gunnery, Towed targets), (*Towing planes, Aerial gunnery), Manned, Training ammunition, Aviation safety, Army aviation, Regulations, Aerial targets, Gunnery trainers, Air defense, Towing cables, Length, Short range(Distance), Flight paths, Firing mechanisms(Weapon), Interrupters, Switches.
Identifiers: Vulcan guns, *Antiaircraft defense systems.

This Directorate was responsible for the study of gunnery practice using targets towed by manned aircraft. The primary objectives were: (1) To recommend changes to AR 385-63 which will allow gunnery practice on targets towed by manned aircraft; and (2) To update the surface danger zone for various ammunition when firing gun air defense systems at aerial and ground targets. The results of the study were based upon comments by numerous agencies and the experience of MTD personnel in conducting aerial firing tests of gun air defense systems. Included in the report are: (1) The recommended firing procedures for gunnery practice; (2) Updated surface danger zones; (3) A general discussion of firing interrupt switches for the Vulcans, M163 and M167; M42, twin, 40-mm; M45, quad, caliber .50; and (4) A discussion of the safety officer's location which will allow him to determine if a safe firing condition exists. It was recommended that: (1) AR 385-63 be changed immediately to reflect the updated surface danger zone information; (2) A program be initiated for development of standardized firing interrupt switches; (3) A firing interrupt switch be an integral part of any future gun air defense system; and (4) Gunnery practice on

targets towed by manned aircraft not be allowed until firing interrupt switches are provided.

15D. Intelligence

AD-A027 248/4GA PC$5.00/MF$3.00
Naval Postgraduate School Monterey Calif
Tactical Electronic Reconnaissance Processing and Evaluation Segment, A New Look.
Master's thesis,
Daniel Patrick Kollay, and Kenneth Lee Kreutzer. Jun 76, 98p

Descriptors: *Electronic reconnaissance, *Data processing, *Tactical reconnaissance, Minicomputers, Electronic aircraft, State of the art, Computer architecture, Computer programs, Computer program documentation, Acceptability, Theses.
Identifiers: Terpes project, CP-642B computers, CP-808 computers, AN/UYK-20, AN/TSQ-90, EA-6B aircraft, Mean time between failures, Cost of ownership, Computer software.

With the proposed procurement of EA-6B aircraft, the U. S. Marine Corps planned the development of TERPES (Tactical Electronic Reconnaissance Processing and Evaluation Segment) to perform post-mission tape analysis. The development phase was initiated on a first generation tactical computer, CP-642B. The thrust of this paper was to identify state-of-the-art replacements for the CP-642B, while identifying areas of concern within the development cycle. Alternative systems were discussed with the emphasis on system flexibility and expandability. (Author)

AD-A027 685/7GA PC$6.75/MF$3.00
Army Electronics Command Fort Monmouth N J
An Automatic Target Tracking and Classification Algorithm (ATTAC) for Unattended Ground Sensors.
Technical rept.,
A. J. Farnochi, J. Karakowski, and E. D. Ulrich. Apr 76, 172p Rept no. ECOM-4403

Descriptors: *Automatic tracking, *Target classification, *Algorithms, *Remote detectors, *Combat surveillance, Battlefields, Monitoring, Remote systems, Target detection, Detector arrays, Personnel, Vehicles, Aircraft, Computer programs, Decision making.
Identifiers: REMBASS(Remotely Monitored Battlefield Surveillance System), Remotely monitored battlefield surveillance system.

CS+TA Laboratory and RDTSA, ECOM, have developed and programmed an Automatic Target Tracking and Classification (ATTAC) algorithm for remotely monitored unattended ground sensors. The algorithm consists of three major functions that are programmed as modules: (1) Trail Array Detection and Tracking, (2) Area Array Detection and Tracking, and (3) Target (Object) Classification.

15E. Logistics

AD-A027 222/9GA PC$3.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Program Funding Guide for Air Force Systems Command Space Programs.
Student project rept.,
Victor William Whitehead. Nov 75, 10p

Descriptors: *Air Force budgets, *Resource management, *Finance, Space systems, Limitations, Project personnel, Planning programming budgeting, Allocations, Research management, Air Force research, Space technology, Test and evaluation, Air Force procurement, Maintenance, Guided missiles, Manuals, Regulations, Federal law, Air Force systems command, Officer personnel.
Identifiers: Program management, Appropriations, Funding, Financial management.

This report provides a guide to pertinent information regarding funds (or appropriations) which will be of concern to the Program Manager (or other Project personnel) of an AFSC space program. Major appropriations of concern in an AFSC space program are likely to be the Research, Development, Test and Evaluation (3600); Missile Procurement (3020); Other Procurement (3080); Operation and Maintenance (3400); and Military Construction (3300) appropriations. Each of these appropriations may fund certain activities and not others, has set obligation lifetimes, and may be reprogrammed within certain limits (except Military Construction). Preceding detailed chapters on each of these appropriations, there is a general information chapter discussing the different program identifiers (Program Element numbers, BPAC's, etc.) and how they are related, funds usage, funds phasing, reprogramming, and obligations.

AD-A027 233/6GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Source Selection in DoD: A Comparison of Procedures and Techniques.
Study project rept.,
Andrew E. Turner, Jr. Nov 75, 62p

Descriptors: *Military procurement, *Management planning and control, Department of Defense, Weapon systems, Acquisition, Sources, Selection, Decision making, Negotiations, Proposals, Policies, Regulations, Efficiency, Contracts.
Identifiers: Program management, Source selection, Requests for proposal.

This study compares existing higher headquarters' source selection policy and procedures for system acquisition within each service and DoD including planning, the solicitation document, evaluation, negotiations and award. The study highlights major attempts within each service to dissemminate source selection related policy and lessons learned. DoD needs to update its policy on source selection to reflect the management philosophy of DoDD 5000.1. Service implementation was found to differ (1) greatly in degree of implementation; (2) in the dedication and success in simplifying the RFP; and (3) in philosophy concerning use of technical transfusions during negotiations. The author recommends: more guidance to less-than-major programs; greater emphasis and weight to evaluations of contractor management; creation of full-time source selection staff assistance; increased involvement of industry in the requirements and RFP development; and recognition in law, as well as in fact, of negotiation as a preferred contracting method for systems acquisition in lieu of formal advertising.

AD-A027 234/4GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Chronic Logistic Support Problems After Transitioning.
Study project rept.,
Kenneth G. Purvis. Nov 75, 47p

Descriptors: *Logistics support, *Naval procurement, *Air Force procurement, *Systems management, Life cycles, Military requirements, Systems engineering, Integrated systems, Logistics management, Weapon systems, Acquisition, Test equipment, Military training, Computer programming, Data processing, Policies, Reliability, Guarantees, Standardization, Contract administration, Transitions.
Identifiers: *Integrated logistics support.

This report provides visibility to some logistical support problems found to be common to a selected number of Navy and Air Force systems. By knowing the primary problems of existing systems, the principles of Integrated Logistic Support (ILS) can be more effectively applied. The problems of primary concern were found to be in the areas of technical data, support and test equipment, supply support, personnel training and computer/software support in general. The conclusions reached were: (1) All support problems can be reduced by reducing just the problems in the technical data area; (2) All problem areas can be significantly reduced through application of ILS principles; (3) Existing Air Force computer program systems can never be adequately supported; and (4) Provisions now exist for procuring supportable computer program systems. These are as directed by AFR 800-14 and AFR 800-14, Vol II.

AD-A027 236/9GA PC$6.00/MF$3.00
Naval Postgraduate School Monterey Calif
A Performance Measurement System for the Aircraft Intermediate Maintenance Department Officer.
Master's thesis,
Irvin Leon Olden. Jun 76, 148p

Descriptors: *Naval planning, *Maintenance management, *Work measurement, *Aircraft maintenance, *Management information systems, Logistics support, Productivity, Repair, Performance, Management planning and control, Theses, Naval training, Cost effectiveness, Integrated systems.
Identifiers: *Performance measurement system, PPB(Planning Programming and Budgeting), Planning programming and budgeting, Maintenance data collection system.

A survey of management control systems presently being employed in the Aircraft Intermediate Maintenance Departments of the U. S. Navy is presented in this thesis and a new standard performance measurement system is recommended based on an analysis of the existing management control concepts. The recommended standard performance measurement system is developed by first defining key result areas for an Aircraft Intermediate Maintenance Department and then constructing measurement indices within each area. This new system incorporates several Navy programs which heretofore have been implemented only on an individual basis. (Author)

AD-A027 253/4GA PC$5.50/MF$3.00
Naval Postgraduate School Monterey Calif
An Analysis of the Oakland Naval Supply Center's Bay Area Local Delivery System.
Master's thesis,
Edward Simon Hernandez, Jr., and Ronald James Gallitz. Jun 76, 104p

Descriptors: *Logistics management, *San Francisco Bay, *Cargo handling, Naval logistics, Delivery, Cost analysis, Reduction, Cost benefits, Cargo vehicles, Trailers, Assessment, Scheduling.
Identifiers: Oakland Naval Supply Center(California).

This document considers the physical distribution function as an area for potential cost savings and improved performance. In particular, the Bay Area Local Delivery (BALD) System of the Naval Supply Center (NSC), Oakland, California, was analyzed. The current method of operation has been compared to a number of alternative approaches and each, in turn, has been analyzed with a view toward effecting a system that would accomplish the local delivery function in an equivalent or better manner for less cost. Conclusions and recommendations have been made taking into account the as-

sumptions developed, the reseacrch effort made, and the findings uncovered during the analysis. (Author)

AD-A027 272/4GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Technical Assessment Annex - A Formal Technical Risk Analysis Role for the Air Force Laboratories in the DSARC Process.
Study project rept.,
William H. Lewark, Jr. Nov 75, 69p
Report on Program Management Course.

Descriptors: *Military research, *Management, *Risk analysis, Systems analysis, Logistics support.

This study project report analyzes a DOD Laboratory Utilization Study recommendation that a Technical Assessment Annex (TAA) be attached to the DCP for DSARC I and II. The TAA would be unedited by other than the 'cognizant' laboratory which prepared it and would identify technical risk areas associated with the program in question and outline plans to resolve those risks. The report data base includes many unpublished documents, as well as selected interviews and a limited survey of the Air Force Laboratory Commanders/Directors. The report is of primary importance to Air Force R and D managers as the Air Force is opposing the TAA recommendation.

AD-A027 273/2GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
A Comparative Analysis of the US Army and US Air Force Requirements Definition During the Conceptual Phase of the Materiel Acquisition Process.
Study project rept.,
David E. Pray, and Jack M. Wells. Nov 75, 60p
Report on Program Management Course.

Descriptors: *Weapon systems, *Army procurement, *Air Force procurement, Military requirements, Costs, Logistics support.

The purpose of this paper is to review current US Army and US Air Force approaches to define needs and requirements for new weapon systems in the Conceptual Phase. From a review of current regulations and directives, and from personal visits to Army Materiel Command, HQ Air Force, and HQ AF Systems Command, the two requirements processes are described. The review and approval cycles for the primary requirements documents (the Army OCD, LOA, and ROC and the Air Force ROC) are described in detail. The processes are then compared for significant differences.

AD-A027 284/9GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Current Focus on Acquisition Management.
Study project rept.,
James R. Patterson, Jr. Nov 75, 52p

Descriptors: *Military procurement, *Management planning and control, Department of Defense, Weapon systems, Acquisition, Optimization, Management information systems, Reports, Organization theory, Logistics management, Project personnel, Perception(Psychology), Decision making, Executives, Methodology, Policies, Regulations, Decentralization, Efficiency.
Identifiers: *Program management, *Acquisition management, Parcipitative management.

The goals of this study were: To determine the degree of change in defense acquisition management since publication of DODD 5000.1; To determine the results of recent actions aimed at improving the acquisition process throughout the U.S. Government; and To determine the impacts of the various perspectives held by top level management on the Program Managers. The author concludes that due to management layering between the Program Manager and the Deputy Secretary of Defense, the timely, accurate and sometimes detailed data required at the top levels of OSD is not forthcoming and thus direct communication is necessary until the situation is remedied. He suggests that the Program Manager keep current on the various views regarding his program throughout the Washington area and that he not try to satisfy everyone in Washington at the expense of program progress.

AD-A027 285/6GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Project Handoff: A System for Transitioning New Equipment to the User.
Study project rept.,
James Vander Naald. Nov 75, 57p

Descriptors: *Logistics management, *Field equipment, *Guided missile components, Project personnel, Operational readiness, Transitions, Reliability, Contract administration, Army equipment, Acceptability, User needs, Field Army, Surface to air missiles, Logistics support, Integrated systems, Weapon systems, Maintainability.
Identifiers: Program management, Handoff project, Army materiel command, Availability.

In order to meet the challenge of transitioning a new item of Army equipment to an operational capability in the hands of a new user in the field, the Army Materiel Command (AMC) has developed a Project HANDOFF approach to the final step of the development cycle. Included in the HANDOFF program is a Materiel Fielding Operation -- the responsibility of a Materiel Fielding Team composed of representatives from the project organization, the contractor, the functional organization, and the user himself. This team implements and coordinates the Materiel Fielding Plan which has as an innovative feature, a Statement of Quality and Support outlining a Commitment on the part of AMC to user satisfaction in the form of a joint user-AMC document formally attested to by signature. Also included, is a sample Outline Materiel Fielding Plan that suggests an approach for implementing the HANDOFF concept.

AD-A027 286/4GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Competitive Reprocurement of DoD Mobile Electric Power Generating Sources.
Study project rept.,
Normand A. Vaillant. Nov 75, 34p

Descriptors: *Military procurement, *Logistics management, Project personnel, Electric power plants, Mobile, Resource management, Contract administration, Standardization, Configuration management, Compatibility, Management planning and control, Integrated systems, Components, Commercial equipment, Acquisition, Sources, Selection, Cost benefits.
Identifiers: *Competitive bidding, *Reprocurement, Design, Competition, Prices, Sole source procurement, Availability.

This study was undertaken for the purpose of analyzing all factors that have a bearing on the formulation of a reprocurement data package such as guidance in the preparation of drawings, source control and commercial components, configuration management, design rights, standardization, kits/accessories and sole source procurement. The study was based on the experience accumulated by the office of the project manager for mobile electric power over the past eight years. The results of the investigation have highlighted many problem areas that can create significant difficulties in maintaining an optimum balance of all key factors and disciplines. The recommendations summarize some of the key areas that shoul be avoided or carefully monitored to insure the adequancy of a reprocurement data package for obtaining identical components each and every time a competitive procurement is made. (Author)

AD-A027 291/4GA PC$4.50/MF$3.00
Naval Postgraduate School Monterey Calif
An Application of Static Marginal Analysis in the Generation of a U.S. Navy Repair Material Requirements List.
Master's thesis,
Gerald Lee Devins, and Jan Dyhr Christensen.
Jun 76, 60p

Descriptors: *Supply depots, *Maintenance management, *Spare parts, *Inventory control, Material, Costs, Repair, Optimization, Military requirements, Logistics, Poisson equation, Mathematical prediction, Theses.
Identifiers: *Marginal analysis, *Stockouts, *Static marginal analysis, Repair material requirements list, R-3350 Engines.

An analysis is made of current Single Supply Support Control Point procedures for developing a Repair Material Requirements List. The objective of this thesis is to minimize the expected cost of stockouts over all line items subject to a budget constraint, given the probability distribution of demand. The concept of static marginal analysis is applied in the generation of a revised Repair Material Requirements List. The revised and the present generation techniques are compared by the use of a simulation of a R3350 aircraft engine overhaul production facility. Results indicate that the Poisson probability distribution function closely matches the demands experienced on the contract used for investigation. Results further indicate that drastic reductions in the number of stockouts, and in the number of orders, can be effected by the use of static marginal analysis in the generation of the Repair Material Requirements List. (Author)

AD-A027 382/1GA PC$4.00/MF$3.00
Construction Engineering Research Lab (Army) Champaign Ill
Erection Procedures for Prefabricated Expandable Foam/Wood Structures.
Final rept.,
R. L. Trent , T. M. Whiteside, and J. Roberts. Jun 76, 36p Rept no. CERL-IR-C-52

Descriptors: *Military facilities, *Expandable structures, *Modular construction, Army equipment, Prefabricated buildings, Composite materials, Wood, Expanded plastics, Forward areas.

This report, the fourth in a series covering development of multi-purpose structural components, presents the field-verified erection procedure for a modular foam/wood building system developed for use in the theater of operations (TO). The system is based on multiple use of modular panels for the floor, wall, and roof, structurally supported by foundation bents and roof trusses. The erection procedures are detailed for use by the Corps of Engineers troops and Project Officer assigned to field test the system at a U.S. Army Training and Doctrine Command (TRADOC) installation. Actual fabrication of the panels, including the foaming operation, is not included in this report.

AD-A027 385/4GA PC$4.50/MF$3.00
Construction Engineering Research Lab (Army) Champaign Ill

Material Handling Equipment for Commissary Warehouses.
Final rept.,
Gerald J. Brown, John R. DeCardy, and Omar E. Rood, Jr. Jun 76, 55p Rept no. CERL-TR-P-67
See also report dated May 76, AD-A027 386.

Descriptors: *Military facilities, *Warehouses, *Materials handling equipment, Storage racks, Pallets, Logistics, Downtime, Cost analysis, Maintenance.
Identifiers: Space utilization, *Commissaries.

This report presents the findings of a material handling equipment (MHE) study performed to develop guidelines for efficient MHE selection in commissary warehouses. The significant factors in MHE selection are storage volume utilization, manpower requirements, purchase cost, operating cost, flexibility, and maintainability. A relative measure of performance under each factor is developed to determine feasibility and economy of equipment alternatives. Guidelines for equipment selection are provided and explained via an example of a standard warehouse configuration. Final choice of equipment for a specific warehouse depends solely on the application for which it will be used.

AD-A027 386/2GA PC$4.00/MF$3.00
Construction Engineering Research Lab (Army) Champaign Ill
Material Handling Equipment Selection Guide for Commissary Warehouses.
Final technical rept.,
John R. DeCardy, Gerald J. Brown, and Omar E. Rood, Jr. May 76, 27p Rept no. CERL-TR-P-68
See also report dated Jun 76, AD-A027 385.

Descriptors: *Military facilities, *Warehouses, *Materials handling equipment, Storage racks, Pallets, Logistics, Downtime, Cost analysis, Maintenance.
Identifiers: Space utilization, *Commissaries.

This report is a condensation of Material Handling Equipment for Commissary Warehouses (CERL Technical Report P-67) and is to be used in selecting efficient and economical Material Handling Equipment (MHE). This selection guide is based on a series of nomographs developed in accordance with basic assumptions about a 'typical' warehouse operation. A step-by-step procedure, which includes an example selection problem, guides the commissary officer in choosing MHE by using information obtained from his own operation. The commissary officer may determine estimates of such basic information as the volume of goods moved through the warehouse; receiving/stocking and picking standards in minutes per carton; MHE requirements; manpower requirements; MHE feasibility; MHE ownership and operating cost; and total cost of the MHE operations. The final equipment choice for a specific warehouse will depend solely on its intended application.

AD-A027 409/2GA PC$7.75/MF$3.00
Army Tropic Test Center Apo New York 09827
Materiel Testing in the Tropics.
Fifth edition.
Feb 76, 215p Rept no. USATTC-7602001
Errata sheet inserted.

Descriptors: *Environmental tests, *Tropical regions, Human factors engineering, Weathering, Test methods, Electronic equipment, Reliability, Accelerated testing, Maintenance, Climate, Degradation, Materials, Jungles, Animals, Geography, Military vehicles, Aging(Materials), Shelf life, Life expectancy, Insects, Air pollution, Humidity, High temperature, Malfunctions.

The US Army Tropic Test Center presents the 1976 update of Materiel Testing in the Tropics. The handbook is a compendium of the US Army's experience in testing equipment in the humid tropics. Sources of information are tropic materiel tests, test methodology investigations, personal experiences, open literature, Department of Defense reports, and voluntary contributions from many scientists and engineers outside of USATTC. The document is the US Army's unofficial corporate memory of tropic materiel testing and is aimed directly at the scientists and engineers in the Army's development centers and test agencies. Topics covered include the Panama Canal Zone environment, history of tropic tests, degrading environmental factors, materiel degradation, tropic reliability and maintainability, vehicular mobility testing sound, visibility, radio propagation, human factors engineering, man-pack portability, and computerized test site selection methods. This document should provide valuable information for those who design, use, or test equipment for eventual deployment in the humid tropics of the world. It includes significant bibliographies of USATTC test and technical reports. (Author)

AD-A027 508/1GA PC$7.50/MF$3.00
Army Quartermaster School Fort Lee Va
Physical Inventory Procedures for General Support Unit (GSU) and Direct Support Unit (DSU) Supply Echelons.
Final rept.,
Mar 76, 186p

Descriptors: *Inventory control, *Logistics management, *Logistics planning, Army, Logistics, Inventory analysis, Management planning and control, Methodology, Effectiveness, Logistics support.

The Physical Inventory Procedures for General Support Unit (GSU) and Direct Support Unit (DSU) Supply Echelons Study has found that current publications dealing with the subject of physical inventory procedures lack comprehensiveness and in some instances are inconsistent. A set of comprehensive physical inventory procedures have been developed and are recommended for implementation. The procedures have been written in detail but in such a manner as to be applicable to all GSU/DSU systems in general. The recommended procedures are designed to serve as a base for the development of physical inventory procedures for ongoing systems such as the manual system, DSU/GSU NCR-500 system, and the Division Logistics (DLOGS) system as well as for future automated supply and accounting systems. (Author)

AD-A027 550/3GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Impact of Changes in the Defense System Acquisition Cycle on Design Team Capability Retention.
Student project rept.,
W. Lee. Boddie. May 75, 57p

Descriptors: *Aircraft industry, *Engineers, *Military procurement, Teams(Personnel), Personnel retention, Concept formation, Research management, Industrial research, Military aircraft, Aeronautical engineering, Manpower utilization, Weapon systems, Acquisition, Policies, Management planning and control, Military research, Design to cost, Incentive contracts, Prototypes.
Identifiers: Fly before buy, Design teams.

This study evaluates the effect of post-1968 changes in the defense system acquisition process on the ability of the aircraft industry to retain the capability of their design teams. Some of the changes as applied in the current economic environment have had an adverse impact upon industry's ability to retain the capability of its design teams, e.g. the fly-before-buy approach appears to lengthen the already extended acquisition cycle, which serves to further aggravate industry's problem regarding design team capability retention. In addition, the 'advanced development prototype' appears to be losing out to Service-laboratory-sponsored Advanced Technology Demonstrator programs. Since these technology base-programs are usually designed to allow increased laboratory involvement, the resulting decrease in design team utilization would adversely impact critical elements of the team needed to develop operational systems. Since overall design team capability is an important national asset, a coherent government policy -- supported by both the legislative and executive branches--is required. Although this policy may well lead to the demise of less successful design teams, the remaining teams should provide sufficient capability and competition if they are adequately supported by a 'market' whose long-term decline will apparently continue.

AD-A027 551/1GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Department of the Army Requirements Generation: an Evaluation.
Student project rept.,
Francis M. Durel. 14 May 75, 39p

Descriptors: *Army procurement, *Military requirements, *Management planning and control, Concept formation, Weapon systems, Acquisition, Policies, Determination, Decision making, Problem solving, Regulations, Validation, Allocations.
Identifiers: Design, Engineering design, Program management.

The Department of the Army policies for acquisition of major systems are contained in AR 1000-1, dated 5 Nov 1974. This regulation establishes the broad framework for the evolution of an idea to a deployed weapon system. A crucial phase in this evolution is the initial requirements generation phase because it is there that a preferred solution to a requirement begins to emerge. This report is limited to discussion of this phase of the acquisiton process and the criticisms that have been made by the Commission on Government Procurement, the Logistics Management Institute Study et al. The Army procedures for identifying the requirement, determining the responsible agencies/organizations, preparing the required documentation and maintaining effective management control/review are described. These procedures are then evaluated against the guidance provided by DOD Directive 5000.1 and the recommendations made by the critical organizations/individuals. The study concludes that the Army had responded to criticisms of the systems acquisition process and formulated a sound policy, thereby providing the means for effective management and control of the requirements generation phase of the systems acquisition process.

AD-A027 560/2GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Application of the Buy American Act to Federal Procurement Activities.
Student project rept.,
Harry D. Gerber. May 75, 41p

Descriptors: *Government procurement, Decision making, Military procurement, Domestic, Policies, Federal law, Unemployment, Acquisition, Economics, Foreign policy, International trade, Protection, Regulations, Limitations, Foreign technology.
Identifiers: Buy american act, Competition, Balance of payments.

This study focuses upon: (1) The legislative environment and background of the Act; (2) The evaluation process used to implement its provi-

sions; (3) The legal precedences relative to interpreting legislative intent; and (4) The applicability to current procurement activities. Problems and disputes continue to occur in implementing this Act, primarily because of the vague and ambiguous wording incorporated in the legislation and overall lack of clear statement of intent. Much of the confusion has resulted from many arbitrary and unilateral decisions concerning its application. The situation has been further aggravated by greatly expanding the scope of the Act to cover numerous socio-economic programs. What initially was intended as an effort to protect the domestic work force has become synonomous with solving a balance-of-payments deficit. A reassessment of program objectives and exemptions, the standardization of evaluation differentials, and the consideration of cost differentials as only one factor in determining 'public interest' could go far in reinstating the original intent of the legislation. This action would provide a realistic approach and a flexible, dynamic tool to cope with the changing international environment.

AD-A027 562/8GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
How Should Testing be Managed Within the Department of Defense.
Student project rept.,
Clarence Marvin DeYoung. May 75, 52p

Descriptors: *Test and evaluation, *Management planning and control, *Test methods, Experimental design, Military research, Research management, Acceptance tests, Operational test and evaluation, Centralized, Policies, Department of Defense, Test facilities, Ranges(Facilities).

The purpose of this study was to broaden the perspective of test and evaluation management by forcing examination of high-level management philosophy. The author contrasts currently available studies, directives, and Congressional opinion with interviews of both policy makers and test personnel. The conclusions drawn suggest that change in current test management is indicated but will probably not take place, unless forced from outside the Department.

AD-A027 569/3GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Project Management Office Interface with the News Media.
Student project rept.,
Frank Dale Green, Jr. May 75, 40p

Descriptors: *Public relations, *Army procurement, Weapon systems, Acquisition, Costs, Project personnel, Army personnel, Management, Public opinion, Media, Newspapers, Communication and radio systems, Periodicals.
Identifiers: Program management, Journalism.

The purpose of this paper is to review present U.S. Army policies and procedures guiding the PMO in its interface with the news media, judge the adequacy of such guidance, and suggest both procedural and philosophical approaches toward an optimum public information interface. The study concludes that weapon's acquisition gets 'bad press' primarily from 'bad' equipment--those acquisitions perceived by the media as technically or, more often, financially 'bad' rather than from faulty public information practices. Successful public information requires a successful project. A good PMO-media interface can help to identify a project as successful when it might not otherwise be so perceived. The author recommends that a PMO must first produce a 'good' weapon system. The PM must be candid in dealings with the press, provided the information desired is not classified or otherwise nonreleasable. Admit to mistakes and failures in the project and tell how they will be corrected. Be timely in providing information to the media. Since costs are the sore spot of weapons acquisition media coverage, public information management attention should be focused there. And, finally, be an advocate for your project, but be an honest advocate.

AD-A027 571/9GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Data Base for a Project Management Information System.
Student project rept.,
Joseph Paul Goncz. May 75, 51p

Descriptors: *Management information systems, *Data management, *Data bases, Weapon systems, Acquisition, Project personnel, Computer personnel, Semantics, Decision making, Department of Defense, Policies.
Identifiers: *Program management.

The program management peculiar aspects of a management information system (MIS) are developed as they reflect the dynamic one-time-through nature of a weapons system acquisition process. DOD policies on information and data are discussed and the dichotomy between the requirement to 'tailor' information systems and their data base and the requirement to utilize but not expand on a system picked from an authorized list remains unresolved. A logical approach to designing the data base is developed and it is concluded that the same sequence would be followed in developing the MIS. In that process, the data base will automatically evolve. (Author)

AD-A027 585/9GA PC$4.00/MF$3.00
Construction Engineering Research Lab (Army) Champaign Ill
Preparation and Review of DD Form 1391.
Final rept.,
Ovadia E. Lev, and William H. Stellhorn. Jun 76, 44p Rept no. CERL-TR-P-89

Descriptors: *Forms(Paper), *Construction, Preparation, Instructions, Military engineering, Computer programming, Computer applications.
Identifiers: Form 1391(DD).

The Military Construction Project Data Sheet (DD Form 1391) is used to state requirements and justifications in support of funding requests for military construction projects. It is submitted for all projects requiring OSD approval, including major and minor new construction and certain projects involving Operations and Maintenance, restoration of damaged facilities, and nonappropriated fund construction. The purpose of this report is to formulate recommendations for computer-assisted processing of DD Form 1391 and to facilitate development of the recommended procedures. Preparation of the form by Army installations and its review by the Office of the Chief of Engineers (OCE) are described. The report also identifies the regulations, criteria, and data sources on which this process is based.

AD-A027 599/0GA PC$4.50/MF$3.00
Air Force Academy Colo
Air Force Procurement Quality.
Final rept.,
Michael W. Gaffney, Joseph Facenda, Collin Flynn, Thomas Topolski, and Wayne Willis. Jun 76, 57p Rept no. USAFA-TR-76-11

Descriptors: *Air Force procurement, *Logistics management, Quality control, Quality assurance, Policies, Cost analysis, Contracts, Questionnaires, Data acquisition, Assessment.

The study was designed to use opinion research to define and rank order factors which influence the quality of procurement actions in the $100,000 to $1,000,000 price range. Two questionnaires were mailed to procurement managers in the field. The results indicate that communication among all parties to a procurement action is most essential to insure quality. Also several environmental factors (e.g., case workload) were identified as well as some important educational and experience qualifications for members of the procurement team. These results now must be validated through an analysis of actual procurement actions. (Author)

AD-A027 658/4GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Understanding Producibility Engineering and Production Planning as Covered in DODD 5000.1.
Study project rept.,
Donald Paul Clark. Nov 75, 57p

Descriptors: *Military procurement, *Systems management, *Production engineering, Military budgets, Industrial production, Military requirements, Regulations, Defense planning, Weapon systems, Acquisition, Decision making, Systems engineering, Technology, Life cycle costs, Cost effectiveness, Design to cost, Value engineering.
Identifiers: *Producibility engineering and planning, Program management.

The goals of this study are: (1) To review the application and understanding of Producibility Engineering and Production Planning by the services; and (2) To show the need for uniform DOD guidance on the subject based on the current political/economic environment concerning DOD material acquisition. A comparative analysis of the understanding and application of the subject by each service shows inconsistencies in the application of Producibility Engineering and Production Planning. The author concludes that there is need for firm DOD guidance to avoid service fragmentation in implementing this methodology.

AD-A027 680/8GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Navy VCX Program.
Student project rept.,
David M. Kletter. May 75, 50p

Descriptors: *Carrier on board delivery, *Transport aircraft, *Naval procurement, *Replenishment at sea, Naval aircraft, Logistics support, Task forces, Payload, Logistics management, Airlift operations, Naval logistics, Acquisition, Delay, Aircraft carriers, Operational readiness, Spare parts, Carrier based aircraft.
Identifiers: VCX aircraft, Resupply.

The purpose of this study was: to verify the operational requirement for Carrier Task Force aerial resupply, to establish the chronological sequence that has evolved in replacing antiquated C-1A and meager C-2A aircraft assets being used in the Fleet today, and to analyze the protracted acquisition process. The author reviews the Navy VCX program that, in 1971, was ranked as the 3rd highest priority development in the aviation community. Since that time, austerity in the Defense Dept. and inefficiencies in the acquisition process have stifled Navy attempts to procure a COD aircraft that will meet both range and payload requirements of the Carrier Task Force in the 1980's. The author analyzed logistics studies, interviewed DoD officials, applied his own first-hand experience, and reviewed Congressional testimony. He offers an understanding of the perturbations that may occur in an austere

development, and shows that tradeoffs are often counterspproductive to meeting operational requirements.

AD-A027 683/2GA PC$4.50/MF$3.00
Office of the Director of Defense Research and Engineering Washington D C
Report of the Defense Science Board Task Force on Federal Contract Research Center Utilization.
Feb 76, 51p

Descriptors: *Contract administration, *Department of Defense, Management planning and control, Utilization, Laboratories, Systems engineering, Military research, Efficiency, Scientific research, Technology, Military requirements, Assessment, Contracts, Military budgets.
Identifiers: Federal contract research centers.

Under the auspices of the Defense Science Board, acting on the request of the Director of Defense Research and Engineering, a comprehensive review of the relationships between the Department of Defense and the Federal Contract Research Centers (FCRCs) has been undertaken. The specially selected Task Force was asked to 'assess the DoD-FCRC relationships and recommend steps that could be taken to improve the short and long term posture of DoD with respect to FCRC utilization. The Task Force carefully reviewed the several previous studies of the FCRCs, and supplemented these with its own hearings, interviews, and deliberations. The conclusions, which strongly endorse the current policy of Defense in the utilization of the FCRCs, are summarized in a Memorandum to the Director of Defense Research and Engineering. The following report details the investigation and, in addition to the summary memorandum, includes a series of specific recommendations from the Task Force. Several addenda providing pertinent data on the current FCRCs are also included. (Author)

AD-A027 684/0GA PC$3.50/MF$3.00
Office of the Director of Defense Research and Engineering Washington D C
Report Management of the Federal Contract Research Centers (FCRCs).
Jun 76, 15p

Descriptors: *Contract administration, *Department of Defense, Management planning and control, Utilization, Laboratories, Systems Engineering, Military research, Efficiency, Scientific research, Technology, Military requirements, Assessment, Contracts, Military budgets.
Identifiers: Federal contract research centers.

The Federal Contract Research Centers (FCRSs) were conceived to provide the Department of Defense (DoD) with a small number of organizations that could provide high quality technical work and policy advice, both solicited and independently offered. To fill these needs organizations were required to possess a depth and breath of familiarity with Service needs, problems and programs like that of the DoD in-house laboratories but with a quality and vitality second to none. The resulting organizations were established (1) as non-profit to assure freedom from profit motive biases, (2) outside the Service's command structure to assure freedom from chain of command biases, and (3) outside the government to permit the management flexibility necessary to attract and retain the best people. The FCRCs were given an unusual degree of access to Service planning and intelligence information and, in turn, have accepted stringent restrictions on their scope and method of operation. Where access to proprietary information of industrial suppliers was necessary, the FCRCs were restricted in activity so that industry would provide such proprietary data with confidence that it was not to their competitive disadvantage.

AD-A027 721/0GA PC$9.75/MF$3.00
Institute for Defense Analyses Arlington Va Cost Analysis Group
A Phase I Report on a Proposed Navy Five Year Department of the Navy Program (FYDP) Logistic Resource Data Base Structure and Associated Resource Displays,
John D. Morgan, Norman B. Davis, Aaron B. Fuller, and Francis L. McDonald. Mar 76, 310p
P-1194, IDA/HQ-76-18267
Contract DAHC15-73-C-0200

Descriptors: *Logistics support, *Naval logistics, *Resource management, *Management information systems, Data bases, Military research, Naval planning, Allocations, Department of Defense, National security, Logistics management, Costs, Logistics planning, Planning Programming Budgeting.

The paper is a Phase 1 report of research to develop an improved Department of the Navy Five Year Program (DNFYP) resource data base structure to provide more meaningful displays of resources allocated to logistic support. The paper describes a conceptual approach to addressing this requirement, presents a proposed Navy ideal logistic support data base structure, and presents sample formats that could be used to display logistic support resources historically consummed and planned for future consumption. The paper also discusses in some depth the Navy data systems that could be used to provide information to the proposed structure and presents a comprehensive discussion of the institutional framework for Navy support to the Department of Defense Security Assistance Program.

AD-A027 742/6GA PC$3.50/MF$3.00
Polytechnic Inst of New York Brooklyn Dept of Electrical Engineering and Electrophysics
Redundant Spares Allocation to Reduce Reliability Costs,
Leonard Shaw, and Sharad G. Sinkar. 1976, 17p
Contract N00014-67-A-0438-0013
Availability: Pub. in Naval Research Logistics Quarterly, v23 n2 p179-194 Jun 76.

Descriptors: *Naval logistics, *Inventory analysis, Redundancy, Optimization, Spare parts, Allocations, Costs, Reduction, Reliability, Reprints.

The problem considered here is the optimal selection of the inventory of spares for a system built from two kinds of modules, the larger of which can be connected so it performs the role of the smaller one. The optimal inventory is the least costly one which achieves a specified probability that the spares will not be exhausted over the design lifetime. For some costs and failure rates it is most economical to use the larger module for both roles, due to the resulting increase in flexibility in the deployment of a single type of spare module. Both analytical and simulation methods have been used to study this problem. (Autor)

AD-A027 755/8GA PC$10.75/MF$3.00
National Guard Bureau Washington D C
Installations. Training Site General Information Summary.
Final rept.
1 Sep 75, 379p Rept nos. NGB-10-76, NGB-PAM-210-21
Supersedes Training Site General Information Summary dated 1 Sep 74.

Descriptors: *Military facilities, *National Guard, Handbooks, Army training, Army aviation, Terrain, Area coverage, Ranges(Facilities), Water supplies, Buildings, Medical services.

This pamphlet provides information relative to the major training sites utilized by the Army National Guard during the inactive duty and annual training periods. The pamphlet is organized by Army Readiness Regions (ARR) and States within each Army Area as well as listing sites in United States Army Alaska (USARAL) and United States Army Pacific (USARPAC).

15G. Operations, Strategy, and Tactics

AD-A027 456/3GA PC$13.00/MF$3.00
Rand Corp Santa Monica Calif
User's Guide to Southeast Asia Combat Data,
G. A. Carter, J. W. Ellis, Jr., A. H. Peterson, J. H. Pierce, and J. S. Reiley. Jun 76, 544p Rept no. R-1815-ARPA
Contract DAHC15-73-C-0181, ARPA Order-189-1

Descriptors: *Tactical data systems, *Southeast Asia, Combat areas, Cambodia, Laos, Vietnam, Data bases, Data processing, Warfare, Military operations.

The document presents a detailed guide to the vast body of available combat and combat-related data from the recent war in Southeast Asia, describing the content, structure, and location of machine-readable and textual data files relating to U.S., Allied, and enemy activities in Cambodia, Laos, and Vietnam through 1975. Characteristics of sites at which data files are located are given, along with detailed file information. The report also includes a description of data-collection techniques used in this survey, and a chronology of events in Southeast Asia from 1945 to 1975.

AD-A027 468/2GA PC$4.00/MF$3.00
Naval Air Test Center Patuxent River Md
Development of a Time-Variant Figure-of-Merit for Use in Analysis of Air Combat Maneuvering Engagements.
Technical memo.,
W. R. Simpson. 16 Jul 76, 39p Rept no. NATC-TM-76-1-SA

Descriptors: *Aerial warfare, *Flight maneuvers, Fighter aircraft, Instrumentation, Tracking, Lethality, Combat effectiveness.

Recent emphasis on Air Combat Maneuvering Testing has led to the development of improved analytic tools for the analysis of air combat data. These improved tools are characterized by a time-variant figure-of-merit or performance index for the determination of engagement treads in one-on-one and multiaircraft air combat. A derivation of the performance index, together with a comparison to present analytic tools, is given. Application to a variety of analysis problems, including design, training, test and evaluation, and operations, are discussed.

AD-B008 711/4GA PC$4.50/MF$3.00
Naval War Coll Newport R I
The Soviet Decision to Invade Czechoslovakia.
Advanced research paper,
Robert M. Guth. 1975, 72p Rept no. NWC/CAR-(CAS)-103S
Distribution limitation now removed.

Descriptors: (*Military operations, Czechoslovakia), (*Military forces(Foreign), USSR), Geopolitics, Attack, Political science, Attitudes(Psychology), Communists, Leadership, Decision making, Attack, Military advisors, Military intelligence, Government(Foreign), Foreign policy, Threat evaluation, NATO, Warsaw pact countries, Reaction(Psychology), Interactions, Treaties, Risk, Risk analysis.

A review of events leading to the Soviet intervention in Czechoslovakia, focusing on factors which influenced the Soviet government's decision to use military force to resolve a growing

political problem. The role of intelligence and security forces in reporting events taking place within Czechoslovakia is described as are the parts played by the Soviet military leadership and the various political positions and pressures exercised by the USSR's Warsaw Pact allies. Finally the decision itself is examined in terms of its timing and the known or suspected stands of the Politburo membership. NATO reactions to the events preceding invasion, and to the invasion itself, are discussed. The paper asserts that intelligence and inept diplomacy provided Moscow with distorted information regarding events in Czechoslovakia, raising alarms that influenced the decision; that the Soviet military leaders preferred a political resolution of the Czechoslovak problem; that the Warsaw Pact allies were divided on the issue but that the conservative were more influential; and that the Politburo membership was divided and did not make its decision until some 10-15 days before invasion. With regard to NATO, its position was clearly and openly one of noninterference--expecting no threat from the action and avoiding all possible provocation of the USSR. The paper closes with a warning that this reaction to the Warsaw Pact's internal troubles, although correct in this instance, could be exploited by the USSR in a future situation, to mask a first strike against Western Europe. (Author)

16. MISSILE TECHNOLOGY

16A. Missile Launching and Ground Support

AD-A027 282/3GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Testability Considerations for the Conceptual and Early Validation Phases of a Missile Weapon System.
Study project rept.,
Richard Clark Smith. Nov 75, 44p

Descriptors: Test and evaluation, Systems management, Flight testing, *Guided missile ranges, Acceptance tests, Test methods, Systems engineering, Project personnel, Instrumentation, *Weapon systems, Range safety, Operational test and evaluation, Guided missile safety, Concept formation.
Identifiers: *Testability, Design, Program management.

This report defines some of the current problems regarding testability in missile weapon systems. Background is provided on the life cycle aspects of test and evaluation and the Major Range system. Potential applications and benefits from early incorporation of testability are presented. Revisions to DOD 5000.3 which focus attention on Testability are proposed.

16B. Missile Trajectories

AD-A027 582/6GA PC$4.00/MF$3.00
Aerospace Corp El Segundo Calif Aerophysics Lab
Dispersion of Spinning Missiles Due to Lift Nonaveraging.
Interim rept.,
Daniel H. Platus. 28 Jun 76, 37p TR-0076(6240-10)-4, SAMSO-TR-76-135
Contract F04701-75-C-0076

Descriptors: *Reentry vehicles, *Attitude control systems, Aerodynamic stability, Lift, Roll, Angle of attack, Pitch(Motion), Yaw.
Identifiers: *Dispersion of spinning missiles, Roll trim dispersions, Spinning missiles, Atmosphere entry.

A new source of cross-range dispersion is identified for spinning missiles. The dispersion is caused from wind-fixed moment perturbations that produce a strong coupling between angle of attack and lift vector precession rate, in contrast to body-fixed moment-induced dispersion of a rolling, trimmed missile in which lift and roll variations are generally uncoupled. Dispersion is shown to occur for initially untrimmed motion in which roll rate has little influence on the lift vector precession rate. Small wind-oriented moments can adversely affect the precession rate, and dispersion depends strongly on the initial motion conditions. Roll control is ineffective for limiting this type of dispersion, and effective control must provide some means of maintaining a steady, nonzero precession rate. (Author)

16D. Missiles

AD-A027 328/4GA PC$4.00/MF$3.00
Air Force Academy Colo
Wind Tunnel Tests of a Maneuvering Air to Surface Submunition (MASS).
Final rept. Jan-May 76,
William A. Edgington. Jun 76, 38p USAFA-TR-76-10, AFATL-TR-76-57

Descriptors: *Air to surface missiles, *Subsonic characteristics, Wind tunnel models, Wind tunnel tests, Fin stabilized ammunition, Aerodynamic stability.

Wind tunnel tests were conducted on 0.2 scale Maneuvering Air to Surface Submunition (MASS) at Mach numbers of 0.31, 0.77, 0.91 and 0.97. The same model was tested in tunnel 1T at the Arnold Engineering Development Center and comparisons were made between the resulting coefficients. Results of the comparison indicate that the data from both wind tunnels are in close agreement. Additional tests were conducted at the USAFA to investigate the static stability of this configuration. Unstable regions were detected in yaw and roll.

AD-A027 692/3GA PC$7.75/MF$3.00
Tennessee Univ Space Inst Tullahoma
Aerodynamic Performance of Missile Configurations at Transonic Speeds Including the Effects of a Jet Plume.
Technical rept. May 71-Sep 75,
J. M. Wu, T. H. Moulden, and N. Uchiyama. 18 Feb 76, 220p RD-76-23

Descriptors: *Guided missile models, *Transonic flow, Inviscid flow, Aerodynamic configurations, Slender bodies, *Exhaust plumes, Boattail afterbodies, Flared afterbodies, Flow separation, Geometric forms, Experimental data, Theory, Computer programs, Computations.
Identifiers: Small incidence, Missile configurations.

This report discusses the flow over various missile configurations with and without fins. Attention has been restricted to transonic flight conditions and to slender bodies at small incidence. Various rear-end geometries are treated, including boattail and flare configurations. The effect of plume induced separation is also included so that realistic estimates of the forces on the body can be made. It is shown that the agreement between theory and experiment is adequate for engineering calculations. (Author)

NTIS/PS-76/0619/7GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Closed Loop Control Systems. Part 2. Miscellaneous Applications (A Bibliography with Abstracts).
Rept. for 1975-Jun 76,
Guy E. Habercom, Jr. Aug 76, 86p
Updates NTIS/PS-75/384.

Descriptors: *Bibliographies, *Feedback control, Automatic control, Adaptive systems, Spacecraft guidance, Missile guidance, Lasers.

Closed loop control systems are investigated relevant to design, application, and performance. Such diversified applications as gas turbine engine controls, feedback control of spacecraft and missiles, and feedback control of laser pulses are examined. (Contains 81 abstracts) See also NTIS/PS-76/0636, Control Theory, Vol. 2. 1974-July, 1976 and NTIS/PS-75/503, Control Theory. Vol. 1. 1970-1973.

PAT-APPL-456 578/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
Jet Tab Steerable Missile.
Patent Application,
John R. Ellison. Filed 26 Mar 74, 8p AD-D002 614/6
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Guided missiles, *Jet tabs, Thrust vector control systems, Steering, Guide vanes.
Identifiers: *Patent applications, PAT-CL-244-3.24.

The patent application relates to a jet tab steerable missile having a plurality of tab-shaped elements rotatably mounted on the rear portion of the missile adjacent the nozzle. The tab-shaped elements are capable of 360 degrees rotary movement from a thrust vector control position into the air stream. In so doing the tab-shaped elements will provide post 'burn out' side force generation, and therefore, extend range control of the missile.

PATENT-3 938 443 Not available NTIS
Department of the Navy Washington D C
Logic Module.
Patent,
Raymond A. Wolski. Filed 17 Jun 74, patented 17 Feb 76, 8p AD-D002 665/8, PAT-APPL-479 936
Supersedes AD-D000 548.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Guided missile fuzes, *Logic devices, *Patents, Cams, Pistons, Springs, Air pressure, Safety and arming(Ordnance).
Identifiers: PAT-CL-102-76.

The patent relates to a logic module system comprising a plurality of cams adapted to be moved by external forces, such as ram air pistons, rate-controlled springs, or the like. The cams are in contact with a spring loaded control member or plunger. Each individual cam is profiled to present a control surface to the plunger at specified time intervals or 'windows.' Dependent on the combined control surfaces present at any instant in time, the spring loaded plunger will respond in a prescribed manner to activate a series of mechanical elements in a guided missile fuze.

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AD-A027 545/3GA PC$3.50/MF$3.00
Texas Univ At Austin Applied Research Labs

Admittance Measurement Accuracies Required to Determine Nonlinear Behavior in Sonar Transducers,
John M. Huckabay, Hollis C. Boehme, and Elmer L. Hixson. 24 Jun 74, 6p AFOSR-TR-76-0639
Contract F44620-71-C-0091
Availability: Pub. in IEEE Transactions on Sonics and Ultrasonics, vSU-22 n2 p101-104 Mar 75.

Descriptors: *Sonar transducers, *Admittance, Gain, Bandwidth, Accuracy, Nonlinear systems, Reprints.

The gain-bandwidth method is an admitttance measurement technique which may be used to indicate nonlinear behavior in ferroelectric ceramics. In applying the gain-bandwidth method or a simple plot of admittance versus frequency as practical measures of nonlinearity in ceramic sonar transducers, experimental measurement inaccuracies must be considered. An expression was derived from experimental data to approximate the error associated with frequency determination on an admittance circle plot as a function of admittance measurement accuracy. This expression was included in error analyses which revealed that the expected accuracy with which the gain-bandwidth may be used in determining nonlinear behavior in ceramic transducers is proportional to the admittance measurement accuracy and the mechanical quality factor of the transducer. Results indicate that admittance measurement errors cause extreme difficulty in the detection of nonlinearities in transducers which exhibit low mechanical quality factors typical of high-power sonar systems. (Author)

AD-A027 596/6GA PC$5.50/MF$3.00
Admiralty Underwater Weapons Establishment Portland (England)
Noise in Broad-Band Hydrophones.
Technical note,
D. Stansfield. May 75, 101p AUWE-TN-521/75, DRIC-BR-51195

Descriptors: *Hydrophones, *Underwater sound, Broadband, Noise(Electrical and Electromagnetic), Ambient noise, Vibration, Radiated noise, Hydrostatic pressure, Electroacoustic transducers, Acceleration, Piezoelectric transducers, Resonant frequency.
Identifiers: Thermal noise, Great Britain.

The sources of noise in underwater electroacoustic hydrophones are considered with particular reference to piezoelectric piston-type elements. Expressions are derived for the various contributions, and their influence on hydrophone design for broad-band reception is discussed. it is shown that measurement of ambient noise levels down to Sea State 1/2 equivalent is possible up to 70 kHz with a correctly designed hydrophone and a low noise amplifier with sufficiently high input impedance. Measurements down to this level are more readily carried out with a spherical hydrophone than with a piston hydrophone in a baffle. The hydrophone parameters of greatest importance are the resonance frequency, coupling coefficient, and hydrophone sensitivity. It is important also to avoid mechanical resonances of the hydrophone mounting. (Author)

AD-A027 736/8GA PC$3.50/MF$3.00
Woods Hole Oceanographic Institution Mass
Long-Range Echo Sounding with a Chirp Source.
Technical rept.,
M. H. Orr, R. C. Spindel, and R. P. Porter. 16 May 75, 8p Rept nos. WHOI-Contrib-3562, WHOI-76-71
Contract N00014-70-C-0205
Availability: Pub. in Jnl. of Geophysical Research, v81 n6 p1197-1200 20 Feb 76.

Descriptors: *Signal processing, *Underwater sound signals, Pulse compression, North Atlantic Ocean, Echo ranging, Long range(Distance), Matched filters, Low frequency, Marine geophysics, Reprints.
Identifiers: Chirp signals.

An experiment has been performed to determine the applicability of coherent signal processing techniques to a long-range low-frequency side-looking bathymetric survey system. A linear FM sweep of 280-Hz center frequency, 10-Hz bandwidth, and 20-s duration was produced by a source at depths between 120 and 150 m towed parallel to the Blank escarpment at a range of about 250 km. Reflected signals were received by a line array towed at depths ranging from 765 to 825 m. The received signals were passed through a digital pulse compressor and averaged. Groups of the received signals were easily identified as reflections from the Blake escarpment. The experiment has shown that coherent signal processing techniques are applicable to low-frequency side-looking bathymetric survey systems.

17B. Communication

AD-A027 150/2GA PC$4.50/MF$3.00
California Univ Los Angeles School of Engineering and Applied Science
On Reliable Topological Structures for Message-Switching Communication Networks,
Izhak Rubin. Mar 76, 64p Rept no. UCLA-ENG-7623
Contract N00014-75-C-0609, Grant NSF-ENG75-03224

Descriptors: *Communications networks, *Message processing, Topology, Network flows, Mathematical models, Switching.

The synthesis of optimal reliable (invulnerable) topological structures for message-switching communication networks is considered. The connectivity of the underlying graphs is used as a measure of the network invulnerability. The maximal average message delay value is used as the network delay measure. Simultaneously with choosing the topological structure, optimal line capacities are assigned. Therefore, the performance measure of a given network structure is chosen to be given by its delay-capacity product function, incorporating the product of the prescribed network maximal delay value and the associated minimal overall line capacity value. A general routing discipline is incorporated to account for dynamic updating of fixed routing procedures, needed to accomodate terminal traffic flow fluctuations.

AD-A027 191/6GA PC$3.50/MF$3.00
Army Electronics Command Fort Monmouth N J
Performance of a J-Band Air-to-Ground Wideband Data Link.
Research and development technical rept.,
James E. Bartow. Jun 76, 14p Rept no. ECOM-4420

Descriptors: *Data links, *Radio interference, *Radio links, Rain, Adverse conditions, Weather, Attenuation, Broadband, Air to surface, J Band, Long range(Distance), Radomes, Antenna feeds, Water impingement.

This report discusses the effects of adverse weather conditions on a long air to ground data link. It includes attenuation due to rain and the degradation of antenna patterns caused by water film absorption on a radome and antenna feeds, and concludes that the link discussed falls about 7 dB short of the required margin for 1% of the year. (Author)

AD-A027 220/3GA PC$4.50/MF$3.00
Massachusetts Inst of Tech Lexington Lincoln Lab
Computer Software for the Navy K-Band Satellite Communications Terminal.
Technical note,
Dale A. McNeill. 24 May 76, 51p TN-1976-25, ESD-TR-76-118
Contract F19628-76-C-0002

Descriptors: *Communication satellite terminals, *Computer program documentation, *Computer programs, *Message processing, Satellite tracking systems, K band, downlink, Magnetic tape, Digital computers.
Identifiers: *Computer software, Autotracking, Les-8 satellite, Les-9 satellite, IBM 370 computers.

A small general purpose computer is an integral part of the Navy experimental K-band communications terminal to provide the necessary computational power and flexibility. The computer functions include: (1) satellite orbit predictions for antenna tracking, (2) received signal integration and comparison for autotracking, (3) adjustments of transmitter power based on information derived from the downlink signal, (4) message editing and processing, (5) verification of correct terminal setup, and (6) recording of input parameters and performance data on magnetic tape for offline processing. (Author)

AD-A027 298/9GA PC$4.50/MF$3.00
Air Force Weapons Lab Kirtland AFB N Mex
A Digitizing System for 525 Line, 60 Hz, Monochrome Television.
Final rept.,
Donald C. Anderson. Jun 76, 64p Rept no. AFWL-TR-76-3

Descriptors: *Digitizers, *Video tape recording, Computer programs, *Disk recording systems, Television equipment, Computer program documentation, Analog to digital converters, Flow charting, Minicomputers, Interfaces, Data acquisition, Image processing, Coders.
Identifiers: *Video processing, Computer software, Monochrome television.

A description is given of a video processing system which is capable of digitizing 525 line, 60 Hz, 2:1 interlace, monochrome television. The system digitizes an area of the TV frame which is programmable in size and position from a programmable number of frames. This is achieved by first recording the data interval to be digitized onto an analog video disc recorder and then digitizing from the disc in a piecemeal manner. A 10 MHz sampling reference is used, allowing a maximum of 524 samples per horizontal TV line with each sample being resolved to a 6-bit binary word. Digital values are assigned according to picture brightness at a given sampling point in the raster with reference black being 0 and reference white being 63. Digital output is recorded on seven-track magnetic tape. Normal input to the system is from a video tape recorder, although the system will accept 525 line standard video from any source. For video tape recorder data, time base correction is provided. IRIG time is included with the digital output using the vertical interval encoding technique. The system offers the advantages of good versatility and high processing speed, although positional repeatability is limited to + or - 1/2 cycle of the reference oscillator. (Author)

AD-A027 365/6GA PC$5.00/MF$3.00
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
A Preliminary Cost Analysis of the Communications Processor for the F-15 Joint Tactical Information Distribution System.
Master's thesis,
William Francis Gaumer. Sep 76, 87p Rept no. GSM/SM/76S-8

Descriptors: *Command and control systems, *Communication equipment, *Cost analysis, *Data processing, *Tactical data systems, Cost estimates, Minicomputers, Logistics support, Computer program documentation, Jet fighters, Air Force budgets, Tactical communications, Theses.
Identifiers: *Communication processors, Computer software, F-15 aircraft.

Budget restraints over the past several years have caused the Department of Defense to take a closer look at the new systems that it requires. Emphasis has been placed on not just the initial cost but the entire life cycle of the system. The Air Force has initiated several studies and projects aimed at reducing the total cost of new aircraft avionic systems. This thesis presents a preliminary analysis of the costs involved in acquiring and supporting a communications processor for the F-15 Joint Tactical Information Distribution System terminal. The characteristics of a digital computer are examined from a historical management perspective as well as the enginering design considerations. Two designs are presented: one is based on the current F-15 central computer while the other is based on current microcomputer technology. The software development and hardware procurement costs are estimated for each design, and the cost impact of the designs on several logistic support costs is also discussed. An analysis of these costs indicates that the microcomputer design would be the least costly of the two designs. Lower hardware procurement costs coupled with lower maintenance costs make the microcomputer design most attractive alternate for implementation into the F-15 JTIDS terminal. (Author)

AD-A027 483/7GA PC$3.50/MF$3.00
Purdue Univ Lafayette Ind School of Electrical Engineering
Variation in Lingual Coarticulation at Certain Juncture Boundaries,
Lo-Soun Su, Raymond Daniloff, and Robert Hammarberg. 1975, 12p AFOSR-TR-76-0707
Grant AF-AFOSR-1776-69
Availability: Pub. in Phonetica, 32 p254-263 1975.

Descriptors: *Phonetics, *Speech, Variations, Vowels, Dispersion relations, Junctions, Reprints.
Identifiers: *Coarticulation.

The acoustic spectra of (m) produced by speakers of American English in various (mV) contexts was studied for coarticulatory variations caused by the (vowel) under conditions of varying juncture boundaries occurring between (m) and (vowel). Dispersion analysis was used to estimate the coarticulatory variation in (m) spectra. Low Level junctures marked by short pauses do not disrupt nasal-vowel coarticulation. However, higher level junctures such as between extraposed clauses or phrases and the body of an utterance are more often than not marked with long pauses, and concomitant reduction of nasal-vowel coarticulation. (Author)

AD-A027 498/9GA PC$9.75/MF$3.00
Harris Corp Melbourne Fla Electronic Systems Div
Digital Modem Study.
Final rept. 12 Sep 75-21 May 76,
J. England. 7 Jul 76, 302p
Contract DCA100-75-C-0037
See also AD-A020 795.

Descriptors: *Modems, *Communication satellite terminals, Integrated circuits, Computer aided design, Digital systems, Phase shift keyers, Decoders, Coders, Cost analysis, Cost estimates, Reliability(Electronics), Error correction codes, Feasibility studies, Maintainability.

Phase 2 of a two-phased program to demonstrate feasibility of using a completely digital implementation for a PSK modulator/demodulator (modem) with an integral error-correcting coder/Viterbi decoder (codec) is described. A demonstration unit was evaluated in the areas of reduced costs, improved performance and stability, reduced maintenance and alignment requirements, improved reliability, and flexibility to accommodate changing mission requirements. The data presented indicates that the technical design goals were met or exceeded, as evidenced by the results of extensive testing. (Author)

AD-A027 600/6GA PC$6.00/MF$3.00
General Electric Co Syracuse N Y Electronics Lab
Command and Control Methodology Study. Volume I. Section I. Communications Satellite Technology.
Final rept.
Oct 74, 130p
Contract DAAB09-74-C-0003
See also Volume 4, AD-A027 601.

Descriptors: *Command and control systems, *Communication satellites, *Multiple access, *Satellite communications, *Information theory, Frequency division multiple access, Time division multiplexing, Time domain, Pulse code modulation, Delta modulation, Coding, Decoding, Voice communications, Methodology, Spread spectrum.
Identifiers: Time division multiple access, Code division multiple access, Pulse address multiple access, Frequency domain.

This report contains a quantitative and qualitative analysis and discussion of several currently known military and commercial satellite multiple-access systems. The report has two main objectives. A tutorial exposition of multiple-access techniques is provided. In addition, the multiple-access realizations are presented in such a manner that given partial information of a multiple-access system the most plausible deduction can be made concerning the missing information of a system. Four multiple-access techniques will be discussed: frequency division multiple-access (FDMA), time division multiple-access (TDMA), code division multiple-access (CDMA) (Sometimes known as spread spectrum multiple-access (SSMA)) and pulse address multiple-access (PAMA). The primary applications of each technique and their major advantages and disadvantages will be given. The basic operational characteristics of each system are described and references to currently implemented systems are included. The time-domain and frequency-domain characteristics of each system are given. Also, the ground station EIRP (effective isotropic radiated power) and G/T (antenna gain-to-noise temperature ratio) requirements as a function of the satellite received system saturation flux density, G/T, and transmitted EIRP are given. The efficiency of each system will be compared.

AD-A027 601/4GA PC$9.75/MF$3.00
General Electric Co Syracuse N Y Electronics Lab
Command and Control Methodology Study. Volume IV. Modulation and Coding Techniques.
Final rept.
Oct 74, 303p
Contract DAAB09-74-C-0003
See also Volume 1, AD-A027 600.

Descriptors: *Command and control systems, *Spread spectrum, *Satellite communications, *Information theory, *Modulation, *Coding, Methodology, Spread spectrum analysis, Pseudo random systems, Secure communications, Radio antijamming, Errors, Teletype systems, Morse code, Synchronization(Electronics), Phase shift keyers.
Identifiers: Frequency hopping, Time hopping.

This volume of the Final Report covers analysis of modulation and coding techniques in satisfaction of the task requirements of the Command and Control Methodology Study contract. The analytical work described in this volume of the Final Report relates to two of the assigned task areas under the contract. Primary emphasis is on the methodology for analyzing spread-spectrum systems and techniques. However, the methodology is also applicable for analyzing and predicting the performance of conventional modulation systems as well as spread spectrum systems. The methodology for determining bit-error rates for ASK, multi-FSK and multi-PSK modulations and character error rates for Morse and teleprinter systems is also applicable to the analyses contained in Volume 2 of this report.

AD-A027 643/6GA PC$5.00/MF$3.00
Joint Tactical Communications Office Fort Monmouth N J
Cost Effectiveness Program Plan for Joint Tactical Communications. Volume III. Life Cycle Costing. Appendix F. Computer Models for LCC.
May 76, 94p Rept no. TTO-ORT-032-76A-V3-APF
See also AD-A023 223 and AD-A021 938.

Descriptors: *Tactical communications, *Cost effectiveness, *Life cycle costs, Computerized simulation, Computer programs, FORTRAN, Communication equipment, Logistics support, Joint military activities.
Identifiers: FORTRAN 4 programming language.

The appendix describes and documents Life Cycle Costing (LCC) computer models and presents sample life cycle cost calculations using the models. The automated models primarily concentrate on O and S costs; however, complete life cycle costs are computed using as inputs point estimates for R and D and equipment unit production costs. The basic TRI-TAC LCCM is presented with the program as written for a Hewlett-Packard HP-9821A and makes reference to the same model which has been programmed in Fortran IV for use on the Burrough's B5550 Time Sharing System. The User's Guide for the Fortran IV version is included and an expanded version of the LCCM program written for the HP-9821A is also provided.

AD-A027 668/3GA PC$3.50/MF$3.00
Culler/Harrison Inc Goleta Calif
Network Voice Transmission. Speech Compression Research at CHI.
Quarterly technical rept. Mar-May 76,
Glen J. Culler, and Michael McCammon. Jul 76, 23p Rept no. CHI-QTR-202
Contract DAHC15-73-C-0252, ARPA Order-2359

Descriptors: *Speech compression, *Conferencing(Communications), *Vocoders, *Communications networks, *Voice communications, Analog systems, Switches, Multiplexing, Speech transmission.
Identifiers: Network conferencing.

A programmatically controlled analog switch unit for multiplexing several participants using a single vocoder into a network voice conference is described. Two methods of using this unit to support variations in conference protocols are discussed. An investigation was made of a proposed variable frame rate transmission system for network voice communication. This LPC-II system was compared with the existing system and several other possible choices. the comparisons are based on listening tests for quality and measured transmission rates. (Author)

NTIS/PS-76/0611/4GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Telephone Systems (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
William E. Reed. Aug 76, 250p*
Supersedes NTIS/PS-75/516.

Descriptors: *Bibliographies, *Telephone systems, *Telegraph systems, *Telecommunication, Telephone cables, Telephone circuits, Global communication, Materials tests, Radiotelephones, Rental equipment, Rates(Costs), Spacecraft communication.
Identifiers: Touchtone telephones, Interconnection(Telephone).

Research is presented on all aspects of the telephone industry, including research covering the manufacture, design, and installation of various kinds of telephone-telegraph equipment, studies on materials research for telephone cables and the application of telephones in weather forecasting, emergency call systems, and in medical facilities. (This updated bibliography contains 245 abstracts, 42 of which are new entries to the previous edition). For economic studies of the telecommunications industry see NTIS/PS-76/0380, Telecommunications--Economic Studies.

NTIS/PS-76/0615/5GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Portable Radio Equipment (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
William E. Reed. Aug 76, 105p*
Supersedes NTIS/PS-75/547.

Descriptors: *Bibliographies, *Radio equipment, Antennas, Radio transmission, Power supplies.

The bibliography cites research on portable transmitters, receivers, antennas, power sources, and components. Reports on wave propagation of portable radio equipment are included. (This updated bibliography contains 100 abstracts, 35 of which are new entries to the previous edition).

N76-25314/5GA PC$5.50/MF$3.00
Notre Dame Univ., Ind. Dept. of Electrical Engineering.
Coordinated Design of Coding and Modulation Systems.
Final Report, 1 Sep. 1974 - 30 Nov. 1975.
J. L. Massey, T. Ancheta, R. Johannesson, G. Lauer, and L. Lee. 14 Jun 76, 114p NASA-CR-148163
Grant NSG-5025

Descriptors: *Biternary code, *Coding, *Modulators, Decoding, Deep space network, Optimization.

For abstract, see STAR 1416

N76-25315/2GA PC$4.00/MF$3.00
Ohio State Univ., Columbus. Dept. of Electrical Engineering.
Preliminary Analysis of 15 Ghz Scintillations on an ATS-5 Satellite-to-Ground Path.
Item 2 Final Report, 11 Jun. 1974 - 31 Jan. 1976.
C. A. Levis, and V. Ungvichian. Feb 76, 27p
NASA-CR-144756, ESL-3863-7
Contract NAS5-21983

Descriptors: *ATS 5, *Communication satellites, *Scintillation, *Spin-orbit interactions, Data links, Millimeter waves, Noise propagation, Precipitation (Meteorology).
Identifiers: Atmospheric attenuation.

For abstract, see STAR 1416

N76-25317/8GA PC$4.00/MF$3.00
McDonnell-Douglas Corp., St. Louis, Mo.
Study of Orbiter/Payload Interface Communications Configuration Control Board Directive from an Operational Perspective.
A. W. Addis, C. G. Tatosian, and J. F. Lidsey. 18 Oct 74, 44p NASA-CR-147767
Contract NAS9-13970

Descriptors: *Interfaces, *Payloads, *Space shuttle orbiters, *Spacecraft communication, Data links, Equipment specifications, Operations research.

For abstract, see STAR 1416

N76-25448/1GA PC$7.50/MF$3.00
TRW Systems Group, Redondo Beach, Calif.
Shuttle Spectrum Despreader.
Final Report.
21 May 76, 199p NASA-CR-147749, TRW-28453
Contract NAS9-14690

Descriptors: *Electric equipment tests, *Sail project, *Spectral resolution, *Wave scattering, Breadboard models, Electronic equipment, Laboratories, Performance tests, Test equipment, Threshold currents.

For abstract, see STAR 1416

N76-25449/9GA PC$4.50/MF$3.00
City Coll. of the City Univ. of New York. Dept. of Electrical Engineering.
Investigation of Television Transmission Using Adaptive delta Modulation Principles.
Final Report, 15 Apr. 1975 - 14 Apr. 1976.
D. L. Schilling. 14 Apr 76, 55p NASA-CR-147776
Contract NAS9-13940

Descriptors: *Delta modulation, *Television transmission, Algorithms, Computerized simulation, Real time operation, Signal transmission, Video data.

For abstract, see STAR 1416

N76-25451/5GA PC$3.50/MF$3.00
Lockheed Electronics Co., Houston, Tex. Aerospace Systems Div.
Design Document for Shuttle Task 501. Shuttle Carrier Aircraft Transceiver Console (Sed 36115353-301).
G. D. Doland. Mar 76, 21p NASA-CR-147765, JSC-11086
Contract NAS9-12200

Descriptors: *Radio relay systems, *Space shuttle orbiters, *Tracking networks, *Transmitter receivers, Design analysis, Engineering drawings, Radio communication, Standardization.

For abstract, see STAR 1416

N76-25453/1GA PC$4.00/MF$3.00
Lockheed Electronics Co., Houston, Tex. Aerospace Systems Div.
Communications and Tracking Subsystem Approach and Landing Test Phase Task 501 RF Path Console Acceptance Test Report.
G. D. Doland. May 76, 26p NASA-CR-147764, LEC-8634
Contract NAS9-12200

Descriptors: Acceptability, *Radio frequencies, *Spacecraft communication, *Spacecraft tracking, Approach control, Data links, Frequency modulation, Quality control, Space shuttles.

For abstract, see STAR 1416

N76-25454/9GA PC$5.00/MF$3.00
RCA Corp., Princeton, N.J. Astro-Electronics Div.
Payload Operation Television System.
Final Report.
1976, 86p NASA-CR-147777
Contract NAS9-14617

Descriptors: *Cargo spacecraft, *Spacecraft television, Closed circuit television, Payloads, Television cameras.

For abstract, see STAR 1416

PAT-APPL-605 578/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
A System to Simulate Motion and Plasma Induced Signal Variations from Reentry Vehicles.
Patent Application,
Joseph L. Poirier. Filed 18 Aug 75, 25p AD-D002 615/3
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Simulators, Radio signals, Reentry vehicles, Microwave communications, Microwave transmission, Motion, Plasma sheaths, Atmosphere entry.
Identifiers: *Patent applications, PAT-CL-343-100.

The patent application relates to a system to simulate motion and plasma induced variations in the attenuation of signals transmitted from reentry vehicles. It uses a controlled attenuator which is programmed to vary the output power of a test transmitter in a way which simulates the variation which would be observed in actual flight. The simulator can be programmed by either an analog wave shaper or a digital driver to control the attenuation characteristics of a voltage control attenuator thus producing signal variations equivalent to those induced by the plasma sheath and motion of the vehicle.

PAT-APPL-673 830/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Data Acquisition and Transfer System.
Patent Application,
John F. Tucker. Filed 5 Apr 76, 12p AD-D002 600/5
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Data transmission systems, Data acquisition, Digital systems, Self organizing systems.
Identifiers: *Patent applications, PAT-CL-178-69.5.

The patent application relates to a digital data communication system using a self-clocking technique for transmitting and receiving data over a single coaxial cable. Each bit of any data stream is divided into four time periods such that both 0 and 1 data bits are hgih during the first time period and a 0 will go low after the first time period and a 1 will be low after the third time period. The first, second and third time periods are used for transmission of information and the fourth for initialization.

PAT-APPL-674 025/GA PC$5.50/MF$3.00
Department of the Navy Washington D C
Programmable Data Terminal Set.
Patent Application,
Edward J. Pasahow, and Carlos Nuese. Filed 5 Apr 76, 104p AD-D002 601/3
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Communication terminals, *Data links, Radio links, Consoles, Digital computers,

Interfaces, Automation, Control, Computer programming, Interequipment communication, Modulation, Demodulation, Signal processing.
Identifiers: NTDS(Navy Technical Data System), Navy technical data system, *Patent applications, PAT-CL-343-175, Computer networks.

The patent application relates to an operator console, a general purpose digital computer and a radio set interface which are connected to perform the modulation and demodulation of the differential coherent quadrature phase shift signal used to transmit the digital information over a computer-to-computer radio link. The console is used to initiate communications and to control and monitor link operation. The computer performs all of the signal processing and control functions. The radio set interface performs analogue-to-digital (A/D) and digital-to-analogue (D/A) conversions for the received and transmitted signals, respectively. The programmable data terminal set (PDTS) also controls the data link operation and sequencing and tests its own performance during operation.

PB-255 061/4GA Mag Tape $200.00;Foreign $400.00
Federal Communications Commission, Washington, D.C. Data Automation Div.
Cable Television Community Unit, Station and Mail Address Files.
Data file,
Jack J. Sharkey. Jul 76, mag tape FCC/DF-76/005
Source tape is in EBCDIC and Honeywell BCD character set. Tape can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Descriptors: *Data file, *Closed circuit television, Communities, Licenses, Frequency allocations, Statistics, Television stations, Magnetic tape, Commerce.
Identifiers: *Cable television.

The Cable Television Community Unit File contains data for each community served by each cable television system (franchise), including the call sign for each TV station (up to 30) whose programming is distributed via the system. The Cable Television TV Station File contains data for each U.S. TV broadcast station and those Canadian and Mexican TV stations likely to be carried on U.S. Cable Television Systems. The Cable Television Mail Address File contains the business mailing address for each major cable television entity, but does not contain the name of the entity.

PB-255 484/8GA PC$4.00/MF$3.00
Office of Telecommunications, Boulder, Colo. Inst. for Telecommunication Sciences.
Numerical Representation of Monthly Median Critical Frequencies of the Regular E Region (foE),
Margo Leftin. May 76, 37p OTR-76-88

Descriptors: *Ionospheric propagation, *Critical frequencies, *E region, Periodic variations, Numerical analysis, Grapha(Charts).

Simple daytime approximations to the diurnal, seasonal, and solar activity dependence of E-region critical frequencies have been extensively used to predict the propagation parameters of the E region. Frequencies, as observed by the vertical incidence ionosondes have been merged with recent work on the nighttime foE by Wakai (1971), to develop a numerical representation of foE continuous over the entire 24 hour period for each month at minimum and maximum solar activity levels. The use of this numerical representation is recommended whenever predictions of foE are required. Sample contour maps derived from this representation are presented.

17D. Electromagnetic and Acoustic Countermeasures

PATENT-3 921 121 Not available NTIS
Department of the Navy Washington D C
Selectable Up or Down Doppler Simulator. Patent,
Peter Huisveld, Jr., Claude C. Routh, and Milton D. Papineau. Filed 12 Jun 64, patented 18 Nov 75, 4p AD-D002 637/7, PAT-APPL-375 696
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Acoustic decoys, *Patents, Doppler effect, Sonar targets, Simulators.
Identifiers: PAT-CL-340-3.

The object of the patent is to provide means for simulating a moving object in the sea. A doppler decoy receives a signal S and repeats the signal with a doppler frequency shift of S/K.

17E. Infrared and Ultraviolet Detection

AD-A027 209/6GA PC$4.00/MF$3.00
Massachusetts Inst of Tech Lexington Lincoln Lab
10.6 micrometer Coherent Monopulse Tracking Interim Results.
Technical note,
Rein Teoste, and William J. Scouler. 7 May 76, 48p TN-1976-19, ESD-TR-76-107
Contract F19628-76-C-0002, ARPA Order-600

Descriptors: *Optical radar, *Infrared tracking, *Satellite tracking systems, Monopulse radar, Coherent radar, Geodetic satellites.
Identifiers: GOES-3 satellite, Atmospheric attenuation.

The report describes the present status and recent results of 10.6 micrometer monopulse radar tracking experiments. Included is a description of the radar system and results of short range (<20 km) and long range (>150 km) tracking experiments which show that useful monopulse processing of IR radar returns can be accomplished. The short range experiments involved a stationary test tower and a moving cooperative aircraft. The long range experiment demonstrated, for the first time, 10.6 micrometer coherent monopulse tracking of a satellite.

AD-A027 576/8GA PC$4.00/MF$3.00
Grumman Aerospace Corp Bethpage N Y Research Dept
A Model for Emission and Scattering of Infrared Radiation from Inhomogeneous Combustion Gases and Particles,
D. Vanderbilt, and M. Slack. Jun 76, 49p Rept no. RM-621

Descriptors: *Infrared signatures, *Exhaust gases, Particles, *Combustion products, Emission, Scattering, Mathematical models, Computer programs, Machine coding, Light scattering, Mie scattering, Heat transfer, Homogeneity, Exhaust plumes, Infrared radiation, Absorption, *Computerized simulation, Models.
Identifiers: *Plume detection, Air pollution detection, Rocket exhaust, Jet engine exhaust.

A model for treating radiant heat transfer in inhomogeneous media containing both gases and anisotropically scattering particles is presented. Absorption and scattering coefficients are calculated for discrete particle sizes using the Dave treatment of Mie scattering. The model incorporates a one dimensional beam approximation and couples the particulate and gaseous heat transfer equations. An existing gaseous infrared radiation computer code has been updated to included particulate scattering, absorption and emission in its calculation of radiant heat transfer from combustion products and exhaust plumes. It is shown that the present model is an improvement over models which merely add independent computations of gaseous and particulate radiation. (Author)

AD-A027 590/9GA PC$4.50/MF$3.00
Intelcom Rad Tech San Diego Calif
Analysis of the Performance of Infrared Detectors under Radiation Environment.
Final rept. Jul 74-Jul 75,
Roland E. Leadon, and Barry A. Green. 26 Jun 75, 54p INTEL-RT-8028-010, AFCRL-TR-75-0363
Contract F19628-72-C-0349

Descriptors: *Infrared detectors, *Radiation effects, Tellurides, Mercury compounds, Cadmium tellurides, Mathematical models, Ionizing radiation, Charge carriers, Recombination reactions, Photoconductors, Silicon, Electric contacts, Avalanche effect(Electronics).
Identifiers: Mercury tellurides.

A computer model for low-temperature silicon detectors has been used to show that blocking contacts have little effect on the response of detectors to pulses of radiation when the recombination lifetime is short compared to the transit time for the device. The same computer model has been used to demonstrate that spontaneous spiking noise in silicon detectors at large biases is apparently the result of avalanche generation of carriers in high-field regions near the device contacts. For HgCdTe detectors, the variation of detector response after a change in background illumination has been shown to be the result of a competition between Shockley-Read and Auger recombination in the bulk of the device.

AD-B007 022/7GA PC$4.50/MF$3.00
Arnold Engineering Development Center Arnold Air Force Station Tenn
Degradation of Low-Scatter Metal Mirrors by Cryodeposit Contamination.
Final rept. Jan-Dec 73,
Frederick Arnold. Oct 75, 68p Rept no. AEDC-TR-75-128
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn., Rept. no. ARO-VKF-TR-75-53.
Distribution limitation now removed.

Descriptors: (*Mirrors, Infrared detectors), (*Infrared optical materials, Degradation), Metals, Cryogenics, Contamination, Oxygen, Carbon dioxide, Deposition, Scattering, Cooling, Exhaust plumes, Outgassing, Molecular beams, Reflectance, Nitrogen.
Identifiers: Cryodeposits.

Cryogenically cooled, low-scatter mirrors are currently in use or planned for use in space applications. An experimental investigation was made to determine the effect of condensed gases on the bidirectional reflectance distribution function (BRDF) of metal mirrors cooled to cryogenic temperatures. Such cryodeposits may develop from control rocket plumes and component outgassing as well as atmospheric contamination. An infrared scatter instrument system was developed for in situ measurement of the test mirror BRDF at 10.6-micrometers wavelength, and a molecular beam was used to provide a well-defined gas source for condensation on the test mirror. Both single species and mixtures were investigated at mirror temperatures from 20 K to 77 K. Oxygen and carbon dioxide deposits caused some increase in scatter, but the most catastrophic failure occurred when a cryodeposit shattered or crystal-

lized. Conditions necessary for removal of cryodeposits are also described. (Author)

PAT-APPL-669 542/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
Mosaic Infrared Sensor.
Patent Application,
Bruce A. Deresh. Filed 23 Mar 76, 8p AD-D002 617/9
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Mosaics(Light sensitive), *Infrared detectors, *Beam splitting, Infrared images, Infrared photoconductors, Integrated circuits, Arrays.
Identifiers: *Patent applications, PAT-CL-250-338.

The patent application concerns a two-dimensional, AC-coupled, wide dynamic range, mosaic infrared sensor which is realized by apparatus that divides incoming infrared radiation into two equal beams. Each beam is received with or without optical concentration by an infrared detector array consisting of a multiplicity of spaced, parallel columns of electrically insulated, independently wired infrared detector elements. The detector element column widths of each detector array are substantially equal to the intercolumn spaces of the other detector array and the columns of each are optically aligned with the intercolumn spaces of the other. This is for use in such applications as the direct transmission of time dependent two-dimensional infrared images with real time video reception, the nonscanning tracking of infrared emitting objects, and thermal imaging (nondestructive testing).

PAT-APPL-674 989/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Determination of Thermal Impedances of Bonding Layers in Infrared Photoconductors.
Patent Application,
Gilbert J. Bartoli, Leon Estuoriety, Roger E. Allen, and Melvin R. Kruer. Filed 8 Apr 76, 9p AD-D002 602/1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Infrared detectors, *Bonded joints, *Heat transfer, Measurement, Epoxy resins, Varnishes, Adhesives, Mercury compounds, Cadmium tellurides, Tellurides, Heat sinks, Thermal conductivity, Laser beams, Radiation effects.
Identifiers: *Patent applications, PAT-CL-324-71, Mercury tellurides.

This patent application relates to a method of determining the thermal conductances and impedances of thermally resistive bonding layers used in infrared photoconductors. In use of an epoxy to bond HgCdTe crystal detectors onto an Irtran 2 or sapphire substrate which is mounted onto a heat sink by a varnish, it has been determined that the epoxy and varnish bonding layers are thermally resistant and restrict heat flow from the detector to the heat sink. Further, the thermal conductances of these layers vary considerably from detector to detector. It has been determined that the thermal recovery processes in laser irradiated infrared photodetectors are specific to the details of their construction. The two thermal recovery times have been determined to be due to the two thermally resistive layers. This method may be used to determine the uniformity of the two resistive layers of already assembled detectors.

17G. Navigation and Guidance

AD-A027 285/8GA PC$4.50/MF$3.00
Massachusetts Inst of Tech Lexington Lincoln Lab
Development of a Discrete Address Beacon System.
Quarterly technical summary rept. no. 17, 1 Jan-31 Mar 76.
1 Apr 76, 72p FAA-RD-76-82
Contract DOT-FA72WAI-261
See also report dated 1 Jan 76, AD-A023 065.

Descriptors: *Discrete address beacon systems, Air traffic control radar beacon system, Data links, Transponders, Surveillance, Systems engineering.
Identifiers: Intermittant positive control.

The report includes results to date of analytical studies, laboratory and flight experiments, and software developments supporting the concept feasibility and performance definition phase of the FAA DABS Program.

AD-A027 281/5GA PC$4.50/MF$3.00
National Aviation Facilities Experimental Center Atlantic City N J
Extended Storage Feature Modifications to the 9020A System.
Final rept. May-Nov 75,
Donald A. Fisher, Lane G. Hinkley, and Charles R. Shaw. Jun 76, 55p FAA-NA-76-15, FAA-RD-76-89

Descriptors: *Air traffic control systems, *Core storage, *Computer architecture, *Computer program documentation, *Computer programs, Central processing units, Data processing, Modification, Computer programming, Acceptance tests, Costs.
Identifiers: *Computer software.

In order to meet the future demands of the Air Traffic Control Upgraded Third Generation System, hardware/software architectural design changes were developed to provide additional core storage and processing capability. These changes, known as the Extended Storage Feature, were implemented in the 9020A System. This report discusses the hardware/software modifications, acceptance tests, and cost considerations involved in implementing this feature. Implementation of the Extended Storage Feature will increase the storage capacity of a 9020A System by 64K words per storage element converted without requiring additional floor space and can be installed without impacting operational activity.

AD-A027 378/9GA PC$6.00/MF$3.00
Facility Checking Squadron (1866th) (Afcs) Richards-Gebaur AFB Mo
TACAN and ILS Station Evaluation Report Norton AFB, CA. 3-27 February 1976.
Final rept.,
Paul W. Nix. 8 Jun 76, 140p Rept no. 76/66N-61

Descriptors: *TACAN, *Glide path systems, Radar stations, Instrument landings, Transponders, Air traffic control systems, Radar beacons, Landing fields, California, Operational test and evaluation.
Identifiers: AN/GRN-20C, AN/GRN-27(V), Tracals project, Norton Air Force Base.

This evaluation report presents data collected and analyzed to defined the capabilities and limitations of the Norton AFB TACAN (AN/GRN-20C), SSILS (AN/GRN-27(V)) and their associated power systems. The ground evaluation phase was conducted 3-8 February and the flight evaluation from 10-26 February. All equipment maintenance was found to be fully satisfactory. Flight results revealed the TACAN was providing solid coverage throught the required service volume except in those areas restructed by line of sight. The localizer flight evaluation revealed good structure with no low clearance, indicating the facility is well sited. A commissioning flight check including airborn phasing was conducted to optimize the glide slope. Airborn and ground evaluations indicated that these facilities were fully capable of providing satisfactory service. The data presented in this report can be used as a valid guide to anticipated performance until there is a significant change in the ground equipment or until a change occurs in the horizontal screening. (Author)

PATENT-3 936 763 Not available NTIS
Department of the Navy Washington D C
Null Input Omega Tracking Filter System.
Patent,
Winslow Palmer. Filed 15 Nov 74, patented 3 Feb 76, 8p AD-D002 655/9, PAT-APPL-524 025
Supersedes AD-D000 564.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Filters, *Omega navigation, *Patents, Nulls(Amplitude), Phase, Tracking, Signal processing.
Identifiers: PAT-CL-329-104.

The patent relates to a tracking filter apparatus for determining the relative phase of synchronized CW navigation systems. The apparatus generates a square wave signal the phase and amplitude of whose fundamental sinusoidal components match those of the fundamental components of signals being tracked. The apparatus operates with a digital computer which processes sample OMEGA amplitudes to acquire and maintain synchronism with the standard OMEGA multiplex pattern.

17H. Optical Detection

AD-A027 393/8GA PC$4.00/MF$3.00
Grumman Aerospace Corp Bethpage N Y Research Dept
The Effect of Blurring on Aircraft Classification by the Moment Method.
Research memo.,
J. Mendelsohn, G. Gardner, and M. Wohlers. Jun 76, 33p Rept no. RM-620

Descriptors: *IFF systems, Aircraft, Classification, Image restoration, Computer applications, Method of moments, Television systems, Telescopes, Pattern recognition.
Identifiers: Television sighting units.

The memorandum describes an investigation of a technique for automatically identifying aircraft silhouettes. The classification of 132 silhouettes of six different scale model aircraft was studied using data obtained from Ohio State University. The effect of the blurring of these images on the ability of the computer program to classify them is shown as a function of the degree of blurring. A discussion of the applicability of this technique to real-world scenarios is included.

AD-A027 681/6GA PC$4.00/MF$3.00
Polytechnic Inst of New York Farmingdale
Research of the Aerophysics Institute for the Strategic Technology Office (DARPA).
Final technical rept. 1 Jul 74-30 Jun 75,
Martin H. Bloom. 30 Jun 75, 37p
Contracts N00014-67-A-0438-0017, ARPA Order-2684

Descriptors: *Optical detection, *Target discrimination, *Laser materials, Fourier transformation, Metal vapors, Laser cavities, Algorithms, Wake, Stratification, Sea water.
Identifiers: Metal vapor lasers, Remote sensing.

The Polytechnic's DARPA-STO-Aerophysics Institute program during the subject period was centered on the improvement of long-range image recognition, i.e., optical discrimination, and on the study of certain laser phenomena. In

the optics area, it was desired to improve the image recovery of an object of finite size from its diffraction-limited image in order to enhance the remote observation of high-altitude objects, such as satellites, perceived through the fluctuating atmosphere. A new algorithm is proposed for computing the transfer of a band-limited function. In the laser area, the major task was the screening of atomic vapors, particularly metal vapors, for new, efficient lasers in the visible and ultraviolet spectral ranges, using computer-modeling and experimental methods. Several promising candidates are identified. In another vein, the theory of unstable resonator cavities was studied in relation to lasers, with a view toward improving the analytic methodology as a complement to numerical techniques, and toward improving design by improving the understanding of the resonance phenomena in cavity configurations. The developments in these areas are summarized herein. A minor effort in this program period was devoted to completion of the final reportage on the experimental simulation of stratified ocean wakes in our thermally-stratified air wind-tunnel.

17I. Radar Detection

AD-A027 151/6GA PC$8.00/MF$3.00
Kansas Univ/Center for Research Inc Lawrence Remote Sensing Lab
Radar Image Simulation Project: Development of a General Simulation Model and an Interactive Simulation Model, and Sample Results.
Contract rept. Dec 74-Feb 76,
J. C. Holtzman, V. H. Kaupp, R. L. Martin, E. E. Komp, and V. S. Frost. Feb 76, 227p RSL-TR-234-13, ETL-0047
Contract DAAK02-73-C-0106

Descriptors: *Radar images, *Side looking radar, *Plan position indicators, *Computer programs, *Interactive graphics, Pattern recognition, Data bases, Subroutines, Computerized simulation, AN/APQ-144, Microwave frequency, Backscattering, Terrain.

This document reports the results of a radar image simulation study performed at the Remote Sensing Laboratory, The University of Kansas, Lawrence, Kansas. The work was sponsored by the U.S. Army Engineering Topographic Laboratories, Fort Belvoir, Virginia. The purpose of this study was to develop radar image simulation and feature extraction techniques. A general model for simulating radar imagery is developed. This model is applicable to both SLAR (Side-Looking Airborne Radar) and PPI (Plan Position Indicator) radar system image formats. It can produce simulations from both flat and mountainous terrain. The model requires as input a completely specified digital ground truth data base. The radar reflectivity data calculated for each image simulation can be determined from a variety of input data sources. The results presented in this document have all been produced using for input reflectivity data, empirical radar backscatter data from a large agricultural/soil moisture data bank available at the Remote Sensing Laboratory. Also reported is a technique for automating feature extraction, creation of data bases, and interactive radar simulation. A model is developed which incorporates an image analyst (human) in the decision process as the computer simulation program runs. Automatic pattern recognition software is used to pre-process the data base and the interpreter/simulator is given the flexibility to specify or alter previous specifications in real-time in synthesizing the radar image. (Author)

AD-A027 267/4GA PC$5.00/MF$3.00
Naval Postgraduate School Monterey Calif
Sampled Analog Recursive Comb Filters and Their Application to MTI- Radar.
Master's thesis,
Lars Terje Saetre. Dec 75, 93p

Descriptors: *Recursive filters, *Signal processing, *Moving target indicators, Charge coupled devices, Cancellation, Radar clutter, Computer programs, Theses, Analog systems.

The design of second order sampled analog filters using Z-transform techniques developed in digital theory was studied. A second order recursive CTD- filter was implemented and investigated. Deviation from theoretical frequency response was found to be partly due to frequency dependent circuitry. MTI- simulation was performed, and the ability of the CTD-filter to cancel clutter and pass doppler frequencies was demonstrated. Unexplained glitches in the filter output were noted.

AD-A027 300/3GA PC$4.00/MF$3.00
Rome Air Development Center Griffiss AFB N Y
Effect of Multipath on the Height-Finding Capabilities of a Fixed-Reflector Radar System. Part I. Analysis,
Ronald L. Fante, Peter R. Franchi, and Richard L. Taylor. May 76, 31p Rept no. RADC-TR-76-169

Descriptors: *Radar equipment, *Height finding, *Monopulse radar, Radar antennas, Radar reflectors, Horn antennas, Antenna radiation patterns, Multipath transmission, Errors, Numerical analysis.

Analytical expressions are derived for the radiation pattern of a fixed reflector antenna on which there are two or more field horns operated in a monopulse mode to obtain target altitude information. Results are obtained for the radiation pattern of an arbitrary reflector located at an arbitrary height above, the earth, and fed by horns which may be located at an arbitrary position.

AD-A027 417/5GA PC$4.50/MF$3.00
Facility Checking Squadron (1868th) (Afcs) Apo New York 09332
Radar Special Evaluation Report. Degradation of AN/UPX-6 Interrogator Set Identification Friend or Foe/Selective Identification Feature (IFF/SIF) Returns from F-4 and RF-4 Aircraft.
TRACALS Evaluation rept.,
Roy A. Parker. 13 May 76, 51p Rept no. 75/68S-17

Descriptors: *IFF systems, *Radar stations, *Radar equipment, *Interrogators, Degradation, Radiofrequency interference, Electromagnetic compatibility, Transponders, Radar beacons, Airborne, Jet fighters, Interrogator transmitters, Ground controlled approach radar.
Identifiers: Selective identification feature, F-4 Aircraft, RF-4 Aircraft, AN/UPX-6, AN/MPN-13.

This report concerns the degraded identification friend or foe/selective identification feature (IFF/SIF) returns received from F-4 and RF-4 aircraft by radar facilities using the AN/UPX-6 interrogator set. The specific system investigated was an AN/MPN-13 mobile ground control approach facility. The primary cause of the degradation was that the alignment of the KY-532B/ASQ airborne transponders in the subject aircraft was not compatible with the interrogation pulses transmitted by the AN/UPX-6. (Author)

AD-A027 686/4GA PC$3.50/MF$3.00
Massachusetts Inst of Tech Cambridge Electronic Systems Lab
A Suboptimal Estimation Algorithm with Probabilistic Editing for False Measurements with Applications to Target Tracking with Wake Phenomena,
Michael Athans, R. H. Whiting, and Michael Gruber. 1976, 19p AFOSR-TR-76-0851
Grant AF-AFOSR-2273-72

Descriptors: *Radar tracking, Algorithms, Probability, Reentry vehicles, Estimates, Wake, Target position indicators, Real time, Stochastic processes, Signal processing, Gaussian noise, False targets, Kalman filtering.

The purpose of this paper is to describe a suboptimal techique called probabilistic edit, which can be used for state variable estimation in conjunction with Kalman filtering techniques when the underlying noisy measurement process can contain false measurements, i.e., measurements containing no information about the state variables are certain random periods of time. The basic probabilistic edit algorithm is modified to accomodate real-time considerations and is incorpoarted into a seven-state extended Kalman filter which: (1) tracks ballistic re-entry vehicles, and (2) estimates their ballistic coefficient. In estimation problems of this kind, the radar measurements of the re-entry vehicles position are corrupted due to contamination of the hard body return with that of the wake. Consequently, a degradation in the performance of the basic tuned extended Kalman filter occurs. Thus, measurements that appear (in a probabilistic sense) to be highly contaminated by wake are modeled as false measurements. The paper includes a discussion of the effect of wake, a description of the basic tracking algorithm, and modifications of the basic tracking algorithm to compensate for the wake corrupted measurements. Finally, the performance of three distinct algorithms: (1) unmodified ballistic tracking filter, (2) modified ballistic tracking filter using a chi-square test to reject bad measurements, and (3) modified ballistic tracking filter using the probabilistic edit algorithm, using actual data will be presented.

AD-B005 971/7GA PC$5.00/MF$3.00
Naval Electronics Lab Center San Diego Calif
Final Report 2175 Modular Radar Project.
Research and development rept. Jun 74-Jun 75,
A. G. Page. 30 Jun 75, 81p Rept no. NELC/TD-433
Distribution limitation now removed.

Descriptors: (*Search radar, *Modules(Electronics)), Costs, Modular construction, Standards, Packaged circuits, Maintenance, Failure(Electronics).

Investigations and analyses were conducted on the feasibility of adopting Standard Electronic Modules as building blocks for surface-search radars. Results of the study indicate the substantial costs savings in radar down times, repair times, and automatic fault isolation can be realized. Procurement costs of modular radar systems are shown to be substantially than for systems which must be designed anew. (Author)

PATENT-3 938 157 Not available NTIS
Department of the Navy Washington D C
Rotatable Radar Antenna Feed and Receiver Horn.
Patent,
Orville G. Brickey. Filed 14 Aug 69, patented 10 Feb 76, 4p AD-D002 662/5, PAT-APPL-851 158
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Radar antennas, *Antenna feeds, *Patents, Monopulse radar, Rotation, Polarization.
Identifiers: PAT-CL-343-756.

The patent describes a rotatable radar antenna feed and receiver horn having two summing ports and a difference port with a rotatable section having a plurality of susceptor pins to rotate the polarization of the transmitted and received electromagnetic energy to reduce or minimize clutter and to enhance a target.

17J. Seismic Detection

AD-A027 158/5GA PC$3.50/MF$3.00
Teledyne Geotech Alexandria Va Alexandria Labs
Special Data Collection System (SDCS), UZBEK SSR, 8 April 1976.
Technical rept.,
K. J. Hill, M. S. Dawkins, and M. D. Gillispie. 16 Jun 76, 11p Rept no. SDCS-ER-76-98
Contract F08606-74-C-0013, ARPA Order-2897

Descriptors: *Seismic signatures, *Epicenters, Data acquisition, Position finding, Seismic arrays, Arrival, Time, Scaling factors, Intensity, Determination, USSR.
Identifiers: LASA project, UZBEK(USSR).

This event report contains seismic data from the Special Data Collection System (SDCS), and other sources for the UZBEK SSR event.

AD-A027 159/3GA PC$3.50/MF$3.00
Teledyne Geotech Alexandria Va Alexandria Labs
Special Data Collection System (SDCS). Eastern Kazakh SSR, (first event), 21 April 1976.
Technical rept.,
K. J. Hill, M. S. Dawkins, and M. D. Gillispie. 16 Jun 76, 11p Rept no. SDCS-ER-76-100
Contract F08606-74-C-0013, ARPA Order-2897

Descriptors: Seismic signatures, *Epicenters, Data acquisition, Position finding, Seismic arrays, Arrival, Time, Scaling factors, Intensity, Determination, USSR.
Identifiers: Kazakh(USSR).

This event report contains seismic data from the Special Data Collection System (SDCS), and other sources for the Eastern Kazakh SSR event.

AD-A027 160/1GA PC$3.50/MF$3.00
Teledyne Geotech Alexandria Va Alexandria Labs
Special Data Collection System (SDCS) Fox Islands, Aleutian Islands, 12 April 1976.
Technical rept.,
K. J. Hill, M. S. Dawkins, and M. D. Gillispie. 16 Jun 76, 16p Rept no. SDCS-ER-76-99
Contract F08606-74-C-0013, ARPA Order-2897

Descriptors: *Seismic signatures, *Epicenters, Data acquisition, Position finding, Seismic arrays, Arrival, Time, Scaling factors, Intensity, Determination, Aleutian Islands.
Identifiers: Fox Islands(Aleutian Islands).

This event report contains seismic data from the Special Data Collection System (SDCS), and other sources for the Fox Islands, Aleutian Islands event.

AD-A027 161/9GA PC$3.50/MF$3.00
Teledyne Geotech Alexandria Va Alexandria Labs
Special Data Collection System Event Report. Eastern Kazakh SSR, (second event), 21 April 1976.
Technical rept.,
K. J. Hill, M. S. Dawkins, and M. D. Gillispie. 16 Jun 76, 11p Rept no. SDCS-ER-76-101
Contract F08606-74-C-0013, ARPA Order-2897

Descriptors: *Seismic signatures, *Epicenters, Data acquisition, Position finding, Seismic arrays, Arrival, Time, Scaling factors, Intensity, Determination, USSR.
Identifiers: Kazakh(USSR).

This event report contains seismic data from the Special Data Collection System (SDCS), and other sources for the Eastern Kazakh SSR event.

AD-A027 162/7GA PC$3.50/MF$3.00
Teledyne Geotech Alexandria Va Alexandria Labs
Special Data Collection System (SDCS). NTS Event 'Inlet', 20 November 1975.
Technical rept.,
K. J. Hill, M. S. Dawkins, R. R. Baumstark, and M. D. Gillispie. 24 Feb 76, 18p Rept no. SDCS-ER-75-71
Contract F08606-74-C-0013, ARPA Order-2897

Descriptors: *Seismic signatures, *Epicenters, Data acquisition, Position finding, Seismic arrays, Arrival, Time, Scaling factors, Intensity, Determination, Sweden.
Identifiers: Inlet shot, Nevada.

This event report contains seismic data from the Special Data Collection System (SDCS), and other sources for the 'Inlet' event. Using SDCS stations, LASA and NORSAR, the epicenter location and magnitudes become: origin time--15:00:02.0, Lat.--37.3N; Long.--116.4W; M sub b--5.7; and M sub s--4.2.

AD-A027 369/8GA PC$4.50/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
Seismic Methods of Locating Military Ground Targets.
Final rept. Aug 73-Sep 74,
Daniel H. Cress. Jun 76, 72p Rept no. WES-MP-M-76-13

Descriptors: *Geophones, *Seismic detection, Signal processing, Military operations, Algorithms, Ground vehicles, Trucks, Armored personnel carriers, Surface targets, Seismic arrays, Seismic signatures, Seismic data, Military vehicles, Acoustic detectors, Position finding, Coupling(Interaction).

An approach for locating military ground targets with a triangular array of geophones is presented. An algorithm that relates the characteristics of the signature received at each geophone to the direction of the target is derived. The signatures are then processed by two methods, which have differing degrees of complexity, to estimate target position. The target-location system (including array deployment) was used in field studies to determine directional angles to military targets, including an M113 APC, an M35 2-1/2-ton truck, an M151 jeep, and an M728 (combat engineering vehicle on an M60 tank chassis). A multiple-target test was also analyzed for targets consisting of the M35 and the M151. Estimated and measured angles were then compared. Results of the analysis indicate that the location of targets using strictly seismic energy and acoustically coupled seismic energy is possible within accuracies of 5 deg and ranges exceeding 450 m.

AD-A027 671/7GA PC$3.50/MF$3.00
Teledyne Geotech Alexandria Va Alexandria Labs
Special Data Collection System (SDCS) Event Report, NTS Event 'COLBY', 14 March 1976.
Technical rept.,
K. J. Hill, M. S. Dawkins, and M. D. Gillispie. 28 May 76, 14p Rept no. SDCS-ER-76-90
Contract F08606-74-C-0013, ARPA Order-2897

Descriptors: *Seismic signatures, *Epicenters, Data acquisition, Position finding, Seismic arrays, Arrival, Time, Scaling factors, Intensity, Determination, Sweden.
Identifiers: Lasa project, COLBY shot, Nevada.

This event report contains seismic data from the Special Data Collection System (SDCS), and other sources for the 'Colby' event.

AD-A027 672/5GA PC$3.50/MF$3.00
Teledyne Geotech Alexandria Va Alexandria Labs
Special Data Collection System (SDCS) Northern Italy, 6 May 1976.
Technical rept.,
K. J. Hill, M. S. Dawkins, and M. D. Gillispie. 30 Jun 76, 11p Rept no. SDCS-ER-76-102
Contract F08606-74-C-0013, ARPA Order-2897

Descriptors: *Seismic signatures, *Epicenters, Data acquisition, Position finding, Seismic arrays, Arrival, Time, Scaling factors, Intensity, Determination, Italy.

This event report contains seismic data from the Special Data Collection System (SDCS), and other sources for the Northern Italy event.

AD-A027 705/3GA PC$7.50/MF$3.00
Systems Science and Software La Jolla Calif
A Deterministic Methodology for Discriminating between Earthquakes and Underground Nuclear Explosions.
Final technical rept. 1 Apr 74-30 Jun 76,
T. C. Bache, J. T. Cherry, D. G. Lambert, J. F. Masso, and J. M. Savino. Jul 76, 182p SSS-R-76-2925, AFOSR-TR-76-0924
Contract F44620-74-C-0063, ARPA Order-1827
See also report dated May 75, AD-A013 121.

Descriptors: *Earthquakes, *Nuclear explosions, *Seismic signatures, Seismic waves, Seismic detection, Underground explosions, Ground motion, Finite difference theory, Seismic arrays.
Identifiers: *Seismic discrimination.

The fundamental problem of interest is that of seismic discrimination. The approach is based on the development of deterministic computational models which predict the important characteristics of the teleseismic ground motion from earthquakes and underground explosions. The theoretical predictions are continuously compared to observations and in this way a confirmed theoretical framework is constructed for testing existing discriminants and for designing new ones. Much of this report is devoted to a study of the earthquake source. A three-dimensional finite difference model for earthquake faulting was developed and an earthquake simulation was carried out. Results from this complex, nonlinear earthquake simulation were compared to equivalent events computed with elastodynamic models of the relaxation and dislocation type. The interesting conclusion is that as a radiator of elastic waves, the finite difference source is similar to the relaxation/volume source model proposed by Archambeau.

18. NUCLEAR SCIENCES AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

AD-A027 196/5GA PC$3.50/MF$3.00
Cornell Univ Ithaca N Y
A Preliminary Study of a Hybrid Fusion Reactor at Moderate Temperature.
Technical rept.,
Richard L. Liboff. 21 Jul 76, 18p Rept no. R7-76
Contract N00014-76-C-0030

Descriptors: *Reactor feasibility studies, *Nuclear power plants, *Nuclear fusion, Nuclear reactors, Hybrid systems, Neutron flux, Fission neutrons, Reactor lattice parameters, Nuclear engineering, Temperature, Lithium com-

pounds, Neutron capture, Heating, Yield, Efficiency, Electric power plants.
Identifiers: Deuterium compounds.

A hybrid fission-fusion system is investigated which operates in a moderate temperature range. The fuel is LiD which is a solid at room temperature. The fusion reaction is maintained by a neutron source from a fission reactor. For a spherically concentric system with interface radius equal to 5m, and a fission neutron flux of 10 to the 13th power/sq cm sec, tge output power due to fusion is estimated to be 10 kw. The direct heating of the lattice owing to Li6 neutron capture for these same dimensions is estimated to be 23 Mw and it is concluded that the system is inefficient as a fusion device. (Author)

18D. Nuclear Instrumentation

AD-A027 403/5GA PC$5.50/MF$3.00
Lnd Inc Oceanside N Y
Production Engineering Measure for High Range Geiger Mueller Tube.
Quarterly rept. no. 8, Mar-May 74,
Robert W. Lehnert. Mar 74, 123p
Contract DAAB05-72-C-5869
See also report dated Feb 74, AD-A007 258.

Descriptors: *Geiger counters, Production engineering, Cathodes, Test methods.
Identifiers: *Production engineering measures, AN/VDR-1.

This program is an investigation of the proper techniques employed to provide stable, predictable performance GM tubes for use as the high range detector of the AN/VDR-1. The techniques include special cathode and anode surface treatment to prevent secondary emissions and resultant spurious counts (instability). Five groups of engineering test samples have been manufactured. Testing on the fourth group has been completed during this reporting period. From all indications the tests prove the units to be completely stable and meet all the requirements of the specification. A study in conjunction with ECOM group at Ft. Monmouth is being conducted on the cathode surface.

PATENT-3 934 165 Not available NTIS
Department of the Navy Washington D C
Proportional Counter End Effects Eliminator.
Patent,
John F. Meekins. Filed 25 Oct 74, patented 20 Jan 76, 4p AD-D002 651/8, PAT-APPL-518 115
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Proportional counters, *Patents, Resistors, Electric conductors, Numerical analysis.
Identifiers: PAT-CL-313-93.

This invention relates to gas-filled proportional counters and more particularly to a construction which eliminates end effects. This invention overcomes the disadvantages of the prior art by inserting a resistor-conductor network at the ends of the counter structure, thereby defining the mathematical boundary conditions there. In particular, the resistor-conductor network can be designed in such a way that the potential at the ends duplicates the potential on an infinitely long counter of similar cross section. By so defining the potential at the ends, the potential everywhere inside the counter becomes that of an infinitely long counter, i.e., eliminating end effects.

18E. Nuclear Power Plants

PB-255 198/4GA PC$4.50/MF$3.00
Nuclear Regulatory Commission, Washington, D.C. Office of Nuclear Reactor Regulation.
Operation of Browns Ferry, Units 1 and 2 Following the March 22, 1975 Fire.
Safety evaluation rept.
18 Jun 76, 68p NUREG-0061-Suppl-1
Supplement to report dated Mar 76, PB-255 474.

Descriptors: *Nuclear reactor safety, *Nuclear power plants, Fire safety, Nuclear electric power generation, Nuclear reactor sites, Detectors, Fire protection, Warning systems, Thermal measuring instruments, Boiling water reactors, Fire prevention, Alabama.
Identifiers: *Browns Ferry nuclear power plant.

The Safety Evaluation Report (SER) by the Division of Operating Reactors Supporting the Operation After the Restoration and Modification of the Browns Ferry Nuclear Plant Units 1 and 2 Following the March 22, 1975 Fire was issued on February 23, 1976. The SER identified matters requiring additional submittals by the Tennessee Valley Authority with subsequent NRC evaluation. The purpose of this supplement is to update the SER based on the NRC evaluation work performed since February 23, 1976.

PB-255 474/9GA PC$5.00/MF$3.00
Nuclear Regulatory Commission, Washington, D.C. Office of Nuclear Reactor Regulation.
Operation of Browns Ferry, Units 1 and 2 Following the March 22, 1975 Fire.
Safety evaluation rept.
Mar 76, 83p NUREG-0061
See also Supplement No. 1, PB-255 198.

Descriptors: *Nuclear reactor safety, *Nuclear power plants, Fire safety, Nuclear electric power generation, Nuclear reactor sites, Power lines, Electric wire, Cable insulation, Fire resistant coatings, Fire protection, Safety devices, Warning systems, Detectors, Fire prevention, Alabama.
Identifiers: *Browns Ferry nuclear power plant.

The Safety Evaluation Report issued February 23, 1976, presents the NRC evaluation regarding the acceptability of the restoration and modifications at the Browns Ferry Plant Units 1 and 2, following the March 22, 1975 fire, to establish that the facility may be operated in the restored and modified condition without endangering the health and safety of the public. The modifications involved enhancing separation of redundant safeguards equipment by some rerouting of cable and by the application of a fire-retardant coating to the cable; enhancing fire extinguishing capability by the addition of fixed spray and sprinkler systems and expanded smoke and heat detection systems; and enhancing the overall fire protection program by changes in procedures, training, and organization. The NRC staff indicated some items that remained to be resolved prior to operation and concluded that subject to their satisfactory resolution the restoration of Browns Ferry Nuclear Plants Units 1 and 2 including the modifications is acceptable and that there is reasonable assurance that the health and safety of the public will not be endangered by operation of the facility as restored and modified.

PB-255 662/9GA PC$5.50/MF$3.00
Nuclear Regulatory Commission, Washington, D.C. Office of Nuclear Reactor Regulation.
Light Water Breeder Reactor. Shippingport Atomic Power Station, U.S. Energy Research and Development Administration. Division of Naval Reactors. Project No. 581.
Safety evaluation rept.
Jul 76, 105p NUREG-0083

Descriptors: *Nuclear reactor safety, *Breeder reactors, *Nuclear power plants, Nuclear reactor sites, Water cooled reactors, Nuclear reactor engineering, Radioactive wastes, Radiation hazards, Pennsylvania.
Identifiers: *Shippingport reactor, Beaver County(Pennsylvania), Light water reactors.

A Safety Evaluation Report, providing comments on the proposed operation of the Light Water Breeder Reactor core in the Shippingport Atomic Power Station, has been prepared by the Office of Nuclear Regulation of the U.S. Nuclear Regulatory Commission. Comments on such operation had been requested by the U.S. Energy Research and Development Administration, Division of Naval Reactors. The U.S. Government owns the Shippingport reactor plant, and the U.S. Energy Research and Development Administration is responsible for the conduct of the Light Water Breeder Reactor program.

PB-255 663/7GA PC$4.50/MF$3.00
Nuclear Regulatory Commission, Washington, D.C. Office of Nuclear Reactor Regulation.
Construction of Washington Public Power Supply System Nuclear Projects No. 3, and No. 5. Washington Public Power Supply System, et al. Supplement No. 1. Docket Nos. STN 50-508, STN 50-509.
Jun 76, 59p NUREG-0023-Suppl-1
See also PB-249 468.

Descriptors: *Nuclear reactor safety, *Nuclear power plants, Nuclear reactor sites, Nuclear reactor containment, Radioactive waste processing, Radiation hazards, Nuclear reactor engineering, Washington(State).
Identifiers: WNP-3 reactor, WNP-5 reactor, Grays Harbor County(Washington).

The Nuclear Regulatory Commission's Safety Evaluation Report in the matter of the application by the Washington Public Power Supply System, et al. to construct the proposed WPPSS-3 and WPPSS-5 was issued on February 13, 1976. The Safety Evaluation described a number of outstanding issues. This supplement presents resolutions to all the outstanding issues contained in the Safety Evaluation.

PB-255 664/5GA PC$5.50/MF$3.00
Nuclear Regulatory Commission, Washington, D.C. Office of Nuclear Reactor Regulation.
A Guide for the Licensing of Facility Operators, Including Senior Operators.
Operator license guide,
Paul F. Collins, and Jerry J. Holman. Jul 76, 124p* NUREG-0094
Revision of rept. no. WASH-1094.

Descriptors: *Licenses, *Operators(Personnel), *Nuclear power plants, Regulations, Achievement tests, Qualifications, Professional personnel, Education, Experience, Power reactors(Nuclear).

This guide describes the procedures and criteria for the issuance of operator and senior operator licenses and is intended to assist applicants and facility licensees to better understand the pertinent provisions of the Commission's regulations in this regard. This guide is not a substitute for the regulations and compliance with the guide is not required.

PB-256 133/0GA PC$4.50/MF$3.00
Nuclear Regulatory Commission, Washington, D.C. Office of Nuclear Reactor Regulation.
Operation of North Anna Power Station, Units 1 and 2. Virginia Electric and Power Company. Supplement No. 2. Docket No. 50-338, and 50-339.
Aug 76, 55p NUREG-0053-Suppl-2
See also PB-253 574.

Descriptors: *Nuclear reactor safety, *Nuclear power plants, Nuclear electric power generation, Site surveys, Design criteria, Nuclear reactor engineering, Radioactive waste, Pollution, Radiation hazards, Radiation effects, Virginia.
Identifiers: *North Anna nuclear power plant, Louisa County(Virginia).

On June 4, 1976, the Nuclear Regulatory Commission issued its Safety Evaluation regarding the application for licenses to operate the North Anna Power Station, Units 1 and 2. The application was filed by the Virginia Electric and Power Company. The Safety Evaluation identified certain matters as either requiring additional information from the applicant or as still being reviewed and stated that these matters would be covered in a subsequent report. Supplement No. 1 to the Safety Evaluation for North Anna was issued on June 30, 1976 and covered issues that remained outstanding when the Safety Evaluation Report was issued. This Supplement, Supplement No. 2 covers all outstanding information and brings the review to a current status.

PB-256 134/8GA PC$10.75/MF$3.00
Nuclear Regulatory Commission, Washington, D.C. Office of Nuclear Reactor Regulation.
Selection of the Preferred Closed Cycle Cooling System at Indian Point Unit No. 2, Consolidated Edison Company of New York, Inc. Docket No. 50-247.
Final environmental statement.
Jun 76, 380p NUREG-0042

Descriptors: *Nuclear power plants, *Environmental impact statements, *Nuclear electric power generation, Cooling systems, Cooling towers, Cooling water, Water pollution, Aquatic animals, Drift, Inorganic salts, Vegetation, Fogging, Taxes, Closed cycle cooling systems, New York.
Identifiers: Air pollution effects(Plants), *Indian Point nuclear power plant, Westchester County(New York), Buchanan(New York).

A Final Environmental Statement for the selection of the preferred closed cycle cooling system for Indian Point Unit No. 2, located at the Village of Buchanan and operated by Consolidated Edison Company of New York, has been prepared by the Office of Nuclear Reactor Regulation of the Nuclear Regulatory Commission (NRC). This statement provides (1) a summary of environmental impacts and adverse effects of the construction and operation of the preferred natural draft cooling tower and (2) a consideration of principal alternatives. Also included are comments of governmental agencies, other organizations and individuals on the Draft Environmental Statement for this project, and staff responses to these comments. The NRC staff has concluded, based on weighing of environmental, economic, technical and other benefits against environmental costs and considering available alternatives, that the preferred closed cycle cooling system is the natural draft cooling tower and hat it should be constructed. It is concluded that an operating license amendment should be issued authorizing construction and operation of the natural draft cooling tower as proposed by the licensee, subject to certain monitoring conditions for protection of the environment.

18I. Reactor Engineering and Operation

NTISUB/B/124-76/007
PC$4.00/MF$3.00
Nuclear Regulatory Commission, Washington, D.C. Office of Inspection and Enforcement.
Monthly Inspection Summary Report.
Jul 76, 60p NUREG-0025-7
See also NTISUB/B/124-76/006.
Paper copy also available on subscription, North American Continent price $35.00/year; all others write for quote.

Descriptors: *Power reactors(Nuclear), *Nuclear fuel reprocessing, *Nuclear research and test reactors, Inspection, Investigations, Quality assurance, Regulations, Nuclear reactor safety, Nuclear power plants.

The scope and findings of inspections and investigations made by the Nuclear Regulatory Commission (NRC) are summarized in a monthly report. These include NRC reports on nuclear power reactors under construction or in operation. Information on individual facilities is presented, including such items as non-compliance with regulations, abnormal occurrence reviews, plant status and, for plants under construction, implementation of quality assurance audits.

NTISUB/B/142-76/006
PC$3.25/MF$3.00
Nuclear Regulatory Commission, Washington, D.C.
Nuclear Regulatory Commission Issuances.
Jun 76, 224p NRCI-76/6
See also NTISUB/B/142-76/005.
Paper copy also available on subscription, North American Continent price $34.00/year; all others write for quote.

Descriptors: *Nuclear reactor safety, *Licenses, *Power reactors(Nuclear), Requirements, Regulations, Pressurized water reactors, Nuclear power plants, Exports.

Contents:
Issuances of the Nuclear Regulatory Commission--Westinghouse Electric Corporation on the application for the export of pressurized water reactor to Asociacion Nuclear ASCO II, Barcelona, Spain;
Issuances of the Atomic Safety and Licensing Appeal Boards--The Cleveland Electric Illuminating Company, et. al. Perry Nuclear Power Plant, Units 1 and 2, The Cleveland Electric Illuminating Company and The Toledo Edison Company, Davis-Besse Nuclear Power Station, Units 1, 2, and 3, Florida Power and Light Company, St. Lucie Nuclear Power Plant, Unit No. 2, Kansas Gas and Electric Company and Kansas City Power and Light Company, Wolf Creek Nuclear Generating Station, Unit No. 1, Pacific Gas and Electric Company, Diablo Canyon Nuclear Power Plant, Units No. 1 and 2, Portland General Electric Company, et. al. Pebble Springs Nuclear Plant, Units 1 and 2, The Toledo Edison Company and The Cleveland Electric Illuminating Company, Davis-Besse Nuclear Power Station, Units 1, 2, and 3, Issuances of the Atomic Safety and Licensing Boards--Public Service Company of Indiana, Marble Hill Nuclear Generating Plant, Units 1 and 2, Public Service Company of New Hampshire, et. al. Seabrook Station, Uni
ts 1 and 2.

PB-255 406/1GA PC$8.00/MF$3.00
Intermountain Technologies, Inc., Idaho Falls, Idaho.
Single-Phase and Two-Phase Flow Measurement Techniques for Reactor Safety Studies.
Topical rept.,
G. F. Brockett, and R. T. Johnson. Jul 76, 243p* EPRI/NP-195

Descriptors: *Nuclear reactor safety, *Nuclear reactor accidents, *Nuclear power plants, *Two phase flow, Measurement, Measuring instruments, Instrumentation, Heat transfer, Nuclear reactor coolants, Experimental design, Pressure, Temperature, Tests, Performance evaluation, Computerized simulation, Energy management, Mathematical models, Tables(Data), Electric power plants.

This report is an assessment of the state-of-the-art of measurement methods which may be used in transient conditions of steam/water or two-phase flow. The material is arranged to provide a relatively uniform evaluation of each of the applicable methods in current practice or presented in the literature. The evaluation attempts to test each method against factors of performance, environmental sensitivities, survival in hostile environments, and implementation. A bibliography keyed to each area of measurement is included. In addition, a companion study by G. F. Hewitt gives further extensive references on two-phase flow measurements. Results are summarized and conclusions offered as to productive areas for improving the state-of-the-art as applied to reactor safety testing for the various measurement categories of pressure and pressure differential, fluid temperature, wall temperature, density and void fraction, flow regime and void distribution, velocity and slip, and liquid level.

PB-255 408/7GA PC$6.00/MF$3.00
Westinghouse Electric Corp., Pittsburgh, Pa. Nuclear Energy Systems Div.
Methodology Development for Statistical Evaluation of Reactor Safety Analyses.
Final rept.,
M. Mazumdar, J. A. Marshall, and S. C. Chay. Jul 76, 142p* EPRI/NP-194

Descriptors: *Nuclear power plants, *Nuclear reactor accidents, *Nuclear reactor safety, *Statistical analysis, Mathematical models, Monte Carlo method, Nuclear reactor coolants, Nuclear fuel claddings, Design criteria, Electric power production, Computerized simulation, Energy management.
Identifiers: Contingency planning, *Loss of coolant, Method of moments, Response surface analysis.

Present Nuclear Regulatory Commission regulations state that the performance of the Emergency Core Cooling Systems (ECCS) for nuclear power plants shall be calculated using evaluation models having certain required features. These evaluation models provide a conservative prediction of the maximum cladding temperature in the event of a design basis accident. It is the objective of EPRI's program in the statistical assessment of ECCS performance to evaluate the conservatism in the evaluation models. The anticipated result will include both an estimate of the most probable or nominal maximum cladding temperature under accident conditions, and an estimate of the probability that the cladding temperature will exceed a given maximum allowable value. This overall effort may be divided into three broad areas. These are: (1) obtaining and characterizing the required basic data; (2) development of best-estimate analytical techniques; and (3) development of methodology for the statistical propagation of input uncertainties through the analytical model. It is the third major area, methodology development for statistical propagation of uncertainties through the best-estimate code, which is the concern of the report.

PB-255 900/3GA PC$3.50/MF$3.00
Cincinnati Univ., Ohio. Dept. of Chemical and Nuclear Engineering.
Evaluation of Pressure Drop Across Area Changes During Blowdown.
Quarterly progress rept. 1 Oct 75-31 Mar 76,
J. Weisman. 1976, 20p NUREG-0047-4
Contract E(11-1)-2152

Descriptors: *Nuclear reactor safety, *Nuclear reactor coolants, *Pressure reduction, Partial

differential equations, Finite difference theory, Mathematical models, Fluorohydrocarbons.
Identifiers: *Blowdown, Ethane/trichlorotrifluoro.

Transient pressure drops across abrupt area changes are to be determined in a series of blowdown experiments. These tests are to be conducted with Freon 113 as the test fluid in a well instrumented apparatus. During this period nearly all instrumentation needed was received. In addition, the data aquisition system was also obtained. Modification of the test apparatus to place it in the configuration required for initial tests is now largely completed. The void sensors to be used in the first blowdown experiment have been calibrated in the steady state freon loop. The calibrated sensors have been installed in the blowdown apparatus. Development of computer programs for analysis of the expected data continues. Two parallel approaches are being followed and programs for each have been written and are being debugged. Stability problems have been encountered in the finite difference approach but the method of characteristics continues to be promising.

18J. Reactor Materials

AD-A027 346/6GA PC$3.50/MF$3.00
Naval Research Lab Washington D C
Effect of Irradiation Parameters on Nickel-Ion Damage in Nickel,
J. A. Sprague, J. E. Westmoreland, F. A. Smidt, Jr., and P. R. Malmberg. 1975, 19p
Availability: Pub. in American Society for Testing and Materials Special Technical Publication 570, p505-524 1975.

Descriptors: *Nuclear reactors, *Radiation damage, *Nickel, Neutron irradiation, Voids, Parameters, Dislocations, Microstructure, Simulation, Ions, Irradiation, Electron microscopy, Reprints.
Identifiers: Defects(Materials).

Void and dislocation structures have been studied in high-purity nickel which had been irradiated with 2.8 MeV(58) Ni+ ions. The irradiation conditions included specimen temperatures between 325 and 725 C, calculated peak damage densities from 4 to 130 displacements per atom (dpa). For the irradiations at .07 dpa/s, voids were formed in specimens irradiated between 525 and 725 C. The maximum swelling at a damage level of 13 dpa was change in V/V = 1.2 percent, observed in a specimen irradiated at 625 C. Irradiation of the same material to 13 dpa at .0007 dpa/s shifted the void formation temperatures approximately 100 C lower and produced a maximum swelling of 2.3 percent at 550 C. Above 13 dpa, the swelling rate was lower, and a value of change in V/V = 2.2 percent was reached at 130 dpa. The results of analyses of these data by void nucleation and growth models are discussed.

18K. Reactor Physics

AD-A027 483/0GA PC$4.50/MF$3.00
Army Engineer Power Group Fort Belvoir Va Engineering Div
The Theoretical Nuclear Analysis of MH-1A Core 5,
Harold D. Hollis , John M. Bryson, II, Bruce B. Palagi, Randall M. DeVault, and Thomas M. Rotchford. 10 Jul 72, 69p Rept no. USAENPG-ED-7211

Descriptors: *Pressurized water reactors, *Reactor cores, *Neutron transport theory, Neutron flux, Computer applications, Computations, Nuclear power plants.
Identifiers: *MH-1A reactor, *MH-1A reactor core 5, LEOPARD computer program, PDQ-7 computer program, LEOPROD computer program.

This report presents the methods and results of the theoretical analysis of the nuclear properties of the MH-1A Core 5. The basic physical parameters are obtained by use of the computer program codes LEOPARD, PDQ-7, and LEOPROD. A lifetime of 134 plus or minus 8 full power weeks is anticipated.

18N. Snap Technology

N76-25668/4GA Not available NTIS
Institutul de Fizica Atomica, Bucharest (Romania).
Use of a Converted Magnetron for Making Electric Generator with Radioisotopes or a Converting Cell of the Fission Nuclear Energy.
G. Cristea, and G. Fratiloiu. Jun 75, 15p IFA-FR-138-1975

Descriptors: *Electric generators, *Magnetrons, Fission, Nuclear energy, Radioactive isotopes.
Identifiers: Romania, *Nuclear auxiliary power units.

For abstract, see STAR 1416

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-A027 208/8GA PC$3.50/MF$3.00
Army Test and Evaluation Command Aberdeen Proving Ground Md
Penetration Tests of Heat Warheads.
Final rept. on test operations procedure.
22 Dec 75, 20p Rept no. TOP-4-2-812
Supersedes AD-718 563 and AD-718 676.

Descriptors: *Projectiles, *Terminal ballistics, Penetration, Armor plate, Antitank ammunition, High explosive ammunition, Firing tests(Ordnance), Test methods.
Identifiers: *Common engineering test procedures, High explosive antitank projectiles.

The report provides a method of determining the penetration ability of HEAT warheads of antitank projectiles, missiles, and rockets. It describes static tests that determine penetration as a function of standoff distance and spin rate and firing tests that provide data on armor penetration at various obliquities and standoff distances. It includes techniques for measuring depth of penetration.

AD-A027 444/9GA PC$3.50/MF$3.00
Stanford Research Inst Menlo Park Calif
Desensitization of Explosive Materials.
Progress rept. no. 1, 15 May-14 Jun 76,
Howard M. Peters, and John M. Guimont. 2 Jul 76, 6p
Contract N00014-76-C-0810

Descriptors: *Explosives, *Desensitizing, Fluorination, Synthesis(Chemistry), Physical properties, Low velocity, Detonations, Sensitivity.

The objective of the work reported here is to determine the generality of the recent discovery that substitution of fluorine for hydrogen in an explosive material leads to desensitization. In earlier work for Lawrence Livermore Laboratory (ERDA) it was discovered that substitution of the -CH2- group in FEFO with a -CF2- group reduces the sensitivity to impact and low velocity detonation (LVD). A comparison of the sensitivity characteristics and physical properties of FEFO and DFF are shown.

AD-A027 685/9GA PC$6.00/MF$3.00
Army Armament Command Rock Island Ill Systems Analysis Directorate
Dynamics of Liquid-Filled Projectiles.
Final rept.,
George Schlenker. Apr 76, 131p Rept no. DRSAR/SA/R-12

Descriptors: *Liquid filled projectiles, *Spin stabilized ammunition, Dynamics, Exterior ballistics, Mathematical models, Computerized simulation, Energy, Vibration, Frequency, Acceleration, Spinning(Motion), Stability, Computer programs.
Identifiers: M-736 projectiles(8-in.).

This report presents a collection of analytic models which treat various aspects of the dynamics of liquid-filled, spin-stabilized projectiles. Several numerical examples are given applicable to eight-inch ammunition. Although idealized, these examples may provide understanding of the behavior of real systems such as the XM736 binary round. Chapter 1 examines the change in inertial characteristics with a change in liquid configuration. Chapter 2 treats the dynamics of spinup of the liquid fill. Also considered are the range and deflection sensitivity to configuration change, and the question of 'ballistic similitude' with a comparable solid-filled projectile. The distribution of energy in the liquid and an approximation for the frequency of a fundamental vibratory mode of the liquid are addressed in Chapter 3. The frequency of vibration is compared with precessional and nutational frequencies of the projectile during flight to assess the likelihood of stability problems. Insofar as the approximations made here are applicable, one can conclude that the XM736 projectile is a reasonable ballistic match to the M509. Difference in mean point of impact can be corrected by small adjustments in aiming. The XM736 is judged to be ballistically stable but will likely have a somewhat larger ballistic dispersion than either the M509 or M106 projectiles. (Author)

AD-A027 709/5GA PC$4.50/MF$3.00
Army Test and Evaluation Command Aberdeen Proving Ground Md
Vertical Target Accuracy and Dispersion.
Final rept. on test operations procedure.
9 Apr 76, 51p Rept no. TOP-4-2-829
Supersedes AD-876 408.

Descriptors: *Ammunition, *Firing tests(Ordnance), Ballistic trajectories, Dispersions, Accuracy, Impact point, Target angle, Test facilities.
Identifiers: Common engineering test procedures.

This test operations procedures provides guidance for conducting low-angle test firings against vertical targets to determine accuracy and dispersion of the ammunition for tank guns, recoilless rifles, and artillery weapons. Such firings also permit observation of the strength of design of the projectiles and measurement of time of flight.

AD-B004 532/8GA PC$4.50/MF$3.00
Picatinny Arsenal Dover N J
A New Approach to Improving the Performance of Non-Ideal Explosives Containing Ammonium Nitrate.
Technical rept.,
J. Hershkowitz, and I. Akst. Mar 75, 58p Rept no. PA-TR-4789
Distribution limitation now removed.

Descriptors: (*Explosives, Optimization), (*Ammonium nitrate, Explosives), Mixtures, Explosives, Detonations, Rates, Reaction kinetics, Modification, Formulations, RDX, Methyl radicals, Concentration(Chemistry), Theory, Computer programs, Computerized simulation, Test methods, Composite materials, Hygroscopicity, Compatibility, TNT, Sensitivity, Mathematical prediction, Velocity.

Identifiers: *Non-ideal explosives, *Amatex 20 explosives, *Amatol explosives, *Amatol explosive 60/40, Chapman-Jouguet theory, Tiger computer program, *Ammonium nitrate/monomethyl, *Ammonium nitrate/tetramethyl.

The performance of Amatol and Amatex explosives in small diameters has been improved by substituting methylammonium nitrates for various fractions of the ammonium nitrate (AN) in these explosives and providing an intimate mixture with the balance of the AN through cosolidification (e.g. co-melt, co-precipitate, mixed crystal). The results demonstrate that a rate limiting step which degrades performance (e.g., species transport), can be partially overcome in some AN-containing non-ideal explosives. The components necessary to promote chemical reaction of the AN were made readily available by putting them in close physical proximity of the AN molecules. Depth of dent in a witness block was determined as a function of fraction of ammonium nitrate replaced. When tetramethylammonium nitrate was used, a peak in dent depth occurred at the CO balance point with ammonium nitrate, indicating synergism. With monomethylammonium nitrate, the dent depth increased with fraction of ammonium nitrate replaced, suggesting a replacement effect stronger than any synergism. Incompatibility of methylammonium nitrates with TNT limit practical use of explosives containing this combination. The results exemplify a new approach to enhancing munition performance by seeking to identify and control the rate-limiting step in an explosive and by the concomitant formulation of new explosives through the modifications made. The various facets of this approach are presented together with the associated problems of measurement and prediction of performance. The directions of future efforts are outlined. (Author)

PAT-APPL-678 572/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Soluble Binders for Plastic Bonded Explosives and Propellants.
Patent Application,
John Frederick Hooper, and Paul Leonard O'Neill. Filed 20 Apr 76, 9p AD-D002 608/8
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Plastic bonded explosives, *Propellants, Formulations, Explosives, Warheads, Binders, Solubility, Casting, Plasticizers.
Identifiers: PAT-CL-149-2, *Patent applications.

Explosive compositions using binders which are soluble in water or which hydrolyze under dilute acidic or basic conditions to yield nontoxic products are disclosed in this patent application. The use of such binders permits one to readily remove the compositions from obsolete warheads or the like. The explosive filler can be reclaimed.

PATENT-3 938 441 Not available NTIS
Department of the Navy Washington D C
Terrain Clearing Device and Method.
Patent,
Robert G. S. Sewell, and Carl C. Halsey. Filed 2 Aug 71, patented 17 Feb 76, 6p AD-D002 664/1, PAT-APPL-168 359
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Terrain, *Defoliation, *Continuous rod warheads, *Patents, Welds, Projectiles.
Identifiers: PAT-CL-102-87, *Terrain clearance, *Plug welds.

The patent relates to a continuous rod warhead which uses ribbon shaped rods plug welded together at alternate ends to form a continuous rod bundle. It is used in terrain clearance. The warhead may either be dropped from an aircraft and contact exploded or hand placed and then exploded by any convenient means.

PATENT-3 961 106 Not available NTIS
Department of the Interior, Washington, D.C.
Method for Applying Wax or Plastic Coatings to Granular Materials.
Patent,
Herman R. Heytmeijer, and Elmer S. Panaccione. Filed 3 Mar 75, patented 1 Jun 76, 5p PB-255 375/8, PAT-APPL-554 834
Supersedes PB-244 190.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Spray coating, *Phosphors, *Explosives, *Patents, Labeled substances, Grains, Waxes, Polyethylene, Coding, Fluorescence.
Identifiers: PAT-CL-427-221, Tracer studies.

A method and apparatus are described for applying a wax or plastic coating to phosphor grains to be added to explosives for tagging purposes. The coating is obtained by spraying from a nozzle a homogenous mixture of molten coating material and phosphor grains and permitting the droplets thus formed to solidify during free fall through a cooling medium such as air. The coated phosphors thus obtained when incorporated into an explosive render the mixture less sensitive to friction and impact than the corresponding mixture employing uncoated phosphors.

PATENT-3 967 990 Not available NTIS
Department of the Interior, Washington, D.C.
Combination of Band-Type and Line-Type Emission Phosphors with Explosive.
Patent,
Frederick M. Ryan, and Frank M. Vodoklys.
Filed 3 Mar 75, patented 6 Jul 76, 4p PB-255 381/6, PAT-APPL-554 839
Supersedes PB-244 186.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Coding, *Phosphors, *Explosives, *Patents, Labeled substances, Grains, Additives, Fluorescence, Ultraviolet radiation, Emission spectra, Inorganic silicates, Manganese, Yttrium compounds, Rare earth elements, Europium, Thulium, Erbium, Dysprosium, Samarium.
Identifiers: PAT-CL-149-109.4, Tracer studies, Zinc silicates, Calcium silicates, Yttrium vanadates.

An inorganic fluorescent phosphor consisting of a spotting phosphor and a coding phosphor is employed for tagging purposes, as for example, tagging explosives to provide post detonation information. The spotting phosphor consists of an inorganic fluorescent material which is excited by UV to produce readily detectable band-type emission, but which produces little or no emission at certain excitation wave lengths. The coding phosphor consists of a different inorganic fluorescent material which emits a line-type emission and which fluoresces efficiently at those excitation wave lengths at which the spotting phosphor produces little or no emission. Exemplary spotting phosphors are zinc silicate and calcium silicate activated by manganese, which show no excitation at a UV radiation of 325 nm. Suitable coding phosphors are yttrium vanadate activated by trivalent rare earth ions, such as europium, thulium, erbium, dysprosium or samarium.

19B. Bombs

PATENT-3 938 438 Not available NTIS
Department of the Navy Washington D C
Pressure-Armed Explosive Apparatus.
Patent,
Matthew E. Anderson, Stephen L. Redmond, John W. Horky, and Leo V. Krolak. Filed 12 Apr 71, patented 17 Feb 76, 8p AD-D002 663/3, PAT-APPL-133 364
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Bomblets, *Arming devices, *Patents, Bomb clusters, Canisters, Time delay fuzes, Arming sequence.
Identifiers: PAT-CL-102-7.2.

The patent relates to an air droppable sealed warhead cannister capable of housing a pluraility of bomblets, each bomblet having a pressure-sensitive fuze capable of being controlled by the presence and absence of a predetermined pressure in the cannister.

19C. Combat Vehicles

AD-A027 361/5GA PC$3.50/MF$3.00
Army Test and Evaluation Command Aberdeen Proving Ground Md
U. S. Army Test and Evaluation Command Test Operations Procedure. Vehicle Test Course Severity.
Final rept.
12 Apr 76, 17p Rept no. TOP-1-1-010

Descriptors: *Test facilities, *Automotive vehicles, Accelerometers, Tracks, Profilometers, Assessment, Visual inspection, Endurance(General), Specifications, Field conditions.
Identifiers: Aberdeen Proving grounds.

This document provides a method of evaluating vehicle test course severity by committee assessment using accelerometers and by spectral analysis of course irregularities. Describes use of profilometer and conversion of profilometer data to power spectral density curves. Includes power spectral densities of Aberdeen Proving Ground endurance test courses for vehicles. (Author)

AD-A027 402/7GA PC$5.00/MF$3.00
Army Armament Command Rock Island Ill Systems Analysis Directorate
Cost/Schedule Uncertainty Analysis of the XM1/Alternative Armament Programs.
Final rept.,
Robert C. Banash, and James B. Beeson. Apr 76, 88p Rept no. DRSAR/SA/R-08

Descriptors: *Tanks(Combat vehicles), *Weapon systems, *Cost analysis, Scheduling, Cost overruns, Production control, Management planning and control, Risk analysis, Retrofitting, Foreign technology.
Identifiers: M-1 tanks, XM-1 tanks, *Tank guns.

A comparison was made of development cost/schedule burdens incurred by adopting either the US 105mm, the UK 110mm or the FRG 120mm armament systems into the US XM-1 Tank Program. These comparisons were made in terms of schedule delays and additional cost to the XM-1 Program. Programs were developed to produce US guns/ammunition from FRG/UK technical data packages. Modifications to the XM-1 Program were structured to account for vehicle redesign phase to accept

the FRG/UK systems. Cost and schedule estimates for each program, that is, US XM-1 with the US 105mm, the UK 110mm and the FRG 120mm armament systems, are presented and compared with the planned XM-1 105mm Program.

19D. Explosions, Ballistics, and Armor

AD-A027 320/1GA PC$3.50/MF$3.00
Princeton Univ N J Dept of Electrical Engineering
Power Spectral Densities of Modulated Error-Correcting Coded Sequences,
James H. Gilchrist, and John B. Thomas. 14 Jan 75, 9p ARO-7624.54-EL
Contract DAHC04-69-C-0012, Grant NSF-GK-24187
Availability: Pub. in IEEE Transaction on Communications, vCOM-23 n11 p1207-1214 Nov 75.

Descriptors: Modulation, *Power spectra, *Error correction codes, Information theory, Density, Digital systems, Signals, Sequences, Reprints.
Identifiers: Block codes.

This paper finds an expression for the spectral density of an error-correcting coded digital sequence after modulation. This expression is valid for dependent source words and error-correcting linear block codes. Several examples are given of the ratio of the spectral density of the coded sequence to an uncoded sequence with identical source word rates for both independent and dependent source words. (Author)

AD-A027 404/3GA PC$4.00/MF$3.00
Army Engineer Waterways Experiment Station Livermore Calif Explosive Excavation Research Lab
Explosive Excavation for Water Environment and Road Cut Applications,
Robert L. LaFrenz. 15 Jun 72, 43p Rept no. EERL-MP-E-72-1

Descriptors: *Excavation, *Chemical ordnance, *Explosives, Cost effectiveness, Underwater explosions, Cratering, Nuclear industrial applications, Construction.
Identifiers: *Explosive excavation.

Since 1962 the U.S. Army Corps of Engineers has been working with the Atomic Energy Commission on a joint program to develop nuclear explosive excavation technology. Until recently the Corps of Engineers portion of this program was the chemical explosive modeling of planned nuclear excavation tests, participation in the nuclear cratering experiments, and development of project designs and engineering and construction data. It became obvious during the conduct of this program that chemical explosive excavation with large charges has many advantages and that the development of chemical explosive excavation as an accepted cost-competitive construction technique will facilitate the acceptance of nuclear explosive excavation for larger projects. Therefore, the emphasis of the program of the Corps for the past three years has been on the use of chemical explosive excavation for Civil Works applications. The technique has been demonstrated on a water conveyance channel in clay shale, a harbor in coral overlain with water, three railroad cuts in a sandstone and shale medium, breaching of a sandbar, and a sidehill road cut excavation.

AD-A027 426/8GA PC$4.00/MF$3.00
Army Engineer Explosive Excavation Research Office Livermore Calif
Summary of Underwater Cratering Tests Conducted at Site 300 during 1970.
Technical memo. Dec 69-May 70, Kenneth T. Sakai, and Robert F. Bourque. Aug 71, 40p Rept no. EERO/TM-70-11

Descriptors: *Cratering, *Underwater explosions, Laboratory tests, Sand, High explosives, Spheres, Water waves, Height finding, Experimental data, Pressure, Mathematical models, Sizes(Dimensions).
Identifiers: Composition C-4.

Laboratory tests were conducted to determine the effect of a water overburden on cratering performance in sand. The objectives were to determine the parameters which describe the effect of the water overburden on the final crater configuration and to develop a relationship for the maximum water wave generated by the explosion. Spherical one-pound charges of composition C-4 were detonated at depths of burial in the medium ranging from 0 to 24 inches with a varying water overburden of 0 to 12 inches. Crater dimensions and maximum wave height data were analyzed empirically with the Buckingham Pi dimensional analysis technique. The data indicate that crater dimensions appear to be sensitive to small changes in water overburden.

AD-A027 502/4GA PC$5.00/MF$3.00
California Univ Berkeley
Fragmentation Processes in Soft Rock.
Final rept. 15 May 73-30 Nov 75,
Werner Goldsmith, and Jerome L. Sackman. 1 Jan 76, 91p DNA-3903F
Contract DNA001-73-C-0226

Descriptors: *Rock, *Terminal ballistics, *Projectiles, Ejecta, Fragmentation, Penetration, Cratering, Compacting, Mechanical waves, Spheres, Shale.
Identifiers: Comminution, Diorite.

An experimental investigation has been undertaken to study the fragmentation of soft and hard rock under conditions of impact by spherical steel projectiles and standard ammunition. Laboratory tests involving the firing of 1/4-inch-diameter steel spheres have been conducted both on the Berkeley campus and at the Naval Weapons Center, China Lake. The velocity range at the first site was from 150 to about 1000 ft/sec, using a compressed gas gun, whereas that at the second location using a powder gun for the sphere ranged from 1100 to 8500 ft/sec. The results of the first year of investigation, comprising all the work performed at China Lake, have been documented in Report DNA 3416Z; in addition, the China Lake performance was published in a separate report NWC TP 5700 (January 1975). The present report concentrates on the activity of the second year of operation. Tests were performed to separately measure the energy contained in the waves generated by the impact in the sample, and special procedures were developed and executed to attempt to determine the surface area associated with cracks produced as the result of the collision. These tests were performed on diorite rather than on shale, since the ejecta formation in the latter was found to be negligible for the range of laboratory impact velocities utilized. Photographic measurements of the ejecta and the determination of the crater topography were continued as in the earlier tests.

AD-A027 627/9GA PC$3.50/MF$3.00
AAI Corp Baltimore Md
Computer-Aided Design of Suppressive Shields.
Final technical rept. for period ending Mar 76,
S. R. Dutton, and D. J. Katsanis. Jun 76, 17p
AAI-ER-8610, EM-CR-76060
Contract DAAA15-75-C-0120

Descriptors: *Shielding, *Munitions industry, *Explosion effects, *Computer aided design, Computer programs, Computers, Structural engineering, Cost analysis.
Identifiers: *Suppressive shielding.

Engineering design procedures are being developed, safety approved, and organized into systematic procedures for application of suppressive structures in US Army ammunition plants. The approved procedures will include use of complex computer programs and charts in time consuming, iterant methods. A study has been conducted to determine computer software, hardware, and terminal requirements; and to estimate computer equipment and operation costs. The results of that study as reported herein indicate a considerable cost savings can be expected by use of computer-aided procedures in design of suppressive shields. (Author)

AD-A027 670/9GA PC$10.50/MF$3.00
Avco Systems Div Wilmington Mass
Hypervelocity Inflight Trajectory Scatter (HITS) Code. User's Manual.
Final rept. Dec 75-Apr 76,
Robert G. Bellaire, and Theodore O. Gustafson. Apr 76, 368p AVSD-0137-76-CR, RIA-R-TR-76-019
Contract DAAA09-74-C-2026

Descriptors: *Projectile trajectories, Computer programming, Dispersing, Manuals, Hypervelocity projectiles, Coding, User needs, Equations of motion, Errors, Fire control computers, Monte Carlo method.
Identifiers: Hits computer code.

This report is a User's Manual for the HITS computer code. The HITS code statistically evaluates projectile dispersion, which is the dispersion associated with the inflight behavior of a gun launched projectile. Projectile dispersion is a fundamental limit on overall weapon system effectiveness. The code is an automated computer-based analytic procedure for computing crossrange and downrange dispersion error budgets and sensitivity coefficients to the sources of projectile dispersion. The error budgets statistically define projectile dispersion at a level conducive to interpretation and comprehensive understanding. Since this report is a User's Manual, the emphasis is placed on providing the information necessary to operate the code and interpret the results. Detailed input/output information is summarized in tables featuring step-by-step cookbook instructions. Example problems are discussed. Appendices present the theoretical and programming fine points, as well as the complete program listing.

19E. Fire Control and Bombing Systems

AD-A027 448/0GA PC$4.00/MF$3.00
Frankford Arsenal Philadelphia Pa
Vibration Study of Radar Receiver/Transmitter M163 Vulcan Air Defense System.
Final engineering rept.,
James H. Wiland. Mar 76, 35p Rept no. FA-TR-76017

Descriptors: *Fire control radar, *Vibration, *Radar equipment, Air defense, Antiaircraft guns, Self propelled guns, Tracked vehicles, Radar transmitters, Radar Receivers.
Identifiers: M-163 Vulcan air defense systems.

This report describes a laboratory vibration study conducted on the Receiver/Transmitter unit of the M163 Vulcan Air Defense System. Field reports indicated an undesirable amount of vibration in the unit during vehicle operation on paved roads, resulting in excessive maintenance requirements. The laboratory study detemined the equipemnt's critical frequencies likely to be excited by vehicle operation, and the associated mode shapes. The primary vibra-

tion problem is identified as insufficient support structure for the microwave chassis. Based on the laboratory test results field damage occuring to the unit mounting hardware does not appear to be a vibration problem. A proposed microwave chassis support bracket was tested in the laboratory and found to increase the natural frequency of the chassis, and to reduce the loosening of components due to vibration. Recommendations are made to incorporate the microwave chassis support bracket in the production unit, and to add unit support brackets if mounting hardware problems continue. (Author)

19F. Guns

AD-A027 250/0GA PC$4.50/MF$3.00
Naval Postgraduate School Monterey Calif
A Field Experiment to Determine the Effectiveness of a Circular Bracketing Sight at Low-Light Levels for the M16A1 Service Rifle.
Master's thesis,
Harold Lloyd Honbarrier. Jun 76, 56p

Descriptors: *Gun sights, *Small arms, *Rifles, Field tests, Theses, Short range(Distance), Quick reaction, Low light levels, Test and evaluation, Effectiveness.
Identifiers: Circular bracket gun sights, Marksmanship, M-16A1 guns(5.56-MM), M-16 guns(5.56-MM).

A field experiment was conducted to determine the effectiveness of a circular bracketing sight in improving the hit capability of the M16A1 rifle at low-light levels at short range in quick-reaction situations. Eight riflemen fired at four pop-up targets that appeared for 2.5 seconds at ranges of 20 and 40 meters. The subjects used weapons fitted with the standard sight (control) and a circular bracket sight. Testing was conducted on the Live Fire Instrumented Range at Fort Hunter-Liggett, Ca., at a low-light level of 0.25 footcandles. Results showed that the bracket sight was 42% better than the standard sight over the entire experiment. (Author)

AD-A027 662/8GA PC$4.50/MF$3.00
Army Command and General Staff Coll Fort Leavenworth Kans
Critique of the Capabilities of the Field Artillery Battalion (8 in, SP) to Accomplish its Nuclear Mission.
Final rept.,
John E. Robbins. 11 Jun 76, 72p
Master's thesis.

Descriptors: *Self propelled guns, *Artillery units, *Nuclear weapons, Field army, Operational effectiveness, Artillery fire, Missions, Battalion level organizations.
Identifiers: Field artillery, Scenarios.

This research examines the capabilities of the field artillery battalion (8 in, SP) to accomplish its nuclear mission. A typical European scenario is used as a vehicle for analysis of the present battalion organization and two alternate battalion organizations. This scenario envisions a massive attack by an aggressor force in an area defended by a U. S. division. Twenty-six hours after the attack begins, nuclear release is received for the division subpackage with a sixty minute pulse beginning four hours later. The three battalion organizations are analyzed for their ability to survey, compute the firing data, communicate, transport, assemble and fire the nuclear weapons. Only one of the battalion organizations is found to be adequate; however, it does not make the most efficient use of men and materiel. Neither of the other two battalion organizations can perform the complete nuclear mission. Utilizing a combination of the present organization and the organization which can accomplish its nuclear mission, an optimal organization is proposed. This organization retains the subelements in the present organization that can adequately perform their tasks related to the nuclear mission and modifies the sub-elements that are found to be inadequate. The resulting battalion organization has one less individual, the same number of vehicles, and a few additional items of equipment. (Author)

19G. Rockets

AD-A027 374/8GA PC$4.00/MF$3.00
Army Missile Research Development and Engineering Lab Redstone Arsenal Ala Aerobalistics Directorate
Attitude Measurement of Rockets with Oscillating Laser Beam.
Technical rept.,
David B. Brown, and Jerry W. Vickers. 20 May 76, 30p Rept no. RD-76-27

Descriptors: *Laser tracking, Attitude(Inclination), Attitude indicators, Remote systems, *Rockets, Retroreflectors, Pitch(Inclination), Yaw, Laser beams, Oscillation, Optical radar, Mathematical models, Data reduction, Algorithms.

A technique for attitude measurement of a non-rolling or slowly rolling vehicle in flight is described in this report. The technique employs a two-color, oscillating laser beam to sweep the flight vehicle. Light is retroreflected from on-board corner cubes to receivers colocated with the transmitter. The output consists of event times for the retroreflected pulses which may be used to infer pitch and yaw attitude. A mathematical model of the system is presented as well as a data reduction algorithm. (Author)

AD-A027 530/5GA PC$4.50/MF$3.00
Air Force Geophysics Lab Hanscom AFB Mass
Dispersion Control System for Sounding Rockets.
Instrumentation papers,
James R. Pickell. 4 Mar 76, 75p Rept nos. AFGL-TR-76-0044, AFGL-IP-246

Descriptors: *Sounding rockets, *Flight control systems, Dispersions, Automatic pilots, Guidance computers, Microprocessors, Computer programming.
Identifiers: Paiute Tomahawk sounding rockets.

High altitude sounding rockets have always presented a problem to small test ranges such as WSMR because of rocket dispersion. This report presents a strap-on dispersion control system employing a 16-bit microprocessor as its brains that requires only software changes to accommodate different sounding rocket vehicles. Mostly the report contains a detailed explanation of the electronic hardware used, and the software developed, for a Paiute-Tomahawk sounding rocket.

AD-A027 660/0GA PC$4.00/MF$3.00
Army Missile Research Development and Engineering Lab Redstone Arsenal Ala Ground Equipment/Materials Directorate
2.75-Inch Rocket Launcher Ice Protection Tests, December 1975 to February 1976.
Technical rept.,
Donald Davis. 18 Mar 76, 32p Rept no. RL-76-13

Descriptors: *Rocket launchers, *Ice formation, Aircraft rockets, Firing tests(Ordnance), Launch tubes, Protection, Adverse conditions, Test methods.
Identifiers: Ice protection, 2.75-in. rocket launchers, Cold weather tests.

A series of 2.75-inch icing test firings was carried out at US Army Missile Command, Redstone Arsenal, Alabama during the winter of 1975-1976. The existence of a launcher icing problem was verified. Several passive protection devices were tested. A final solution was not found, but the ground-work for future efforts was laid. (Author)

20. PHYSICS

20A. Acoustics

AD-A027 204/7GA PC$6.75/MF$3.00
Naval Undersea Center San Diego Calif
Sound-Speed Distribution in the Western Indian Ocean.
Research and development rept. Jul 74-Nov 75,
J. G. Colborn. Feb 76, 170p Rept no. NUC-TP-502

Descriptors: *Acoustic velocity, *Indian Ocean, *Underwater sound, Seasonal variations, Thermoclines, Bathythermograph data, Tables(Data).

Initial results of a continuing study to analyze and summarize the acoustically significant characteristics of the vertical sound-speed structure in the Indian Ocean are presented for purposes of acoustic model inputs and future exercise planning in the region. Data displays cover the western Indian Ocean west of 75 degrees E and north of 20 degrees S. Hydrocast data with computed sound speeds at standard depths provide the basic information to define areas of the Indian Ocean that are reasonably homogeneous with regard to sound-speed properties and can be summarized by a single profile for each season. Seasonal data presentations of bottom conjugate depth (the shallow conjugate of the bottom sound speed) and depth excess (water depth below the deep conjugate of the near-surface sound-speed maximum) indicate the primarily bottom-limited situation in the western Indian Ocean and identify the restricted areas of the Somali Basin with convergence-zone propagation potential. The upper-layer characteristics of layer depth, in-layer gradient, and below-layer gradient are displayed seasonally in contour format based on sound-speed-converted BT and XBT temperature data. Emphasis is placed on the significant effects of the seasonal monsoons, and in particular the strong SW Monsoon, on the near-surface structure. Results based on the two data sources are presented separately and some comparisons are made.

AD-A027 354/0GA PC$4.50/MF$3.00
Naval Underwater Systems Center New London Conn New London Lab
Propagation Loss Model Assessment at Low Frequencies in a Bottom-Limited Region.
Technical rept.,
Grant Gartrell, and Frederick R. DiNapoli. 30 Jun 76, 51p Rept no. NUSC-TR-5391

Descriptors: *Underwater sound, *Sonar pulses, *Sonar projectors, Continuous waves, Ocean models, Low frequency, Bahama Islands, Propagation, Losses, Coastal regions, Ocean bottom, Acoustic waves, Acoustic impedance.
Identifiers: Bill project.

A physical insight into the problem of low frequency propagation loss modeling in a bottom-limited region is gained by comparison of a representative range of prediction models with a precisely determined set of experimental data. One series of the Project BILL(Below and In Layer Propagation Loss) measurements was conducted at 100 Hz during December 1973 in the Tongue of the Ocean, Bahama Islands, at a water depth of approximately 1800 meters. A pulsed CW acoustic projector was towed at a depth of 76 meters along an accurately determined track to a range of 40 kiloyards. The pulses were received at hydrophones located both in and below the surface duct. Despite excellent experimental control, predictions from various

propagation loss models have been unable to reproduce major features of the multipath interference structure of the data. Although few firm conclusions are possible, the report discusses several possible contributory causes for the discrepancies, major among these being inadequat bottom modeling. Implications for future trends in the development of low frequency propagation loss models for bottom-limited regions are briefly examined. (Author)

AD-A027 396/1GA PC$5.00/MF$3.00
Naval Research Lab Washington D C
Computer Programs for Obtaining Sound Speeds from Digitized Environmental Data.
Interim rept.,
David A. Nutile. 28 Jun 76, 78p Rept no. NRL-7993

Descriptors: *Underwater sound, *Acoustic velocity, *Computer applications, *Bathythermographic data, Salinity, Computer programs, Computations, FORTRAN, North Atlantic Ocean.
Identifiers: Ocean temperature.

A system of programs has been written in Fortran for obtaining sound speeds in meters per second from digitized depth vs temperature data, in most cases XBT's. Six separate programs were used to allow for human decisions at key steps in the process to ensure reliable results. Archival Nansen-cast data were used to calculate the grouped, avenged salinities. These values, along with the temperature data, are used to calculate sound speed from Leroy's second formula. Report-quality plots of the temperature and sound speed profiles are produced. This report explains the steps used, describes the programs completely, and gives examples of the outputs provided.

AD-A027 522/2GA PC$5.00/MF$3.00
Pennsylvania State Univ University Park Applied Research Lab
Acoustic Radiation Fields of Axisymmetric Spherical Sources with Mixed Boundary Conditions.
Master's thesis,
Christopher C. Gerding. 11 Mar 76, 82p Rept no. TM-76-76
Contract N00017-73-C-1418

Descriptors: *Acoustic fields, *Underwater sound, Fourier analysis, Legendre functions, Wave equations, Computer programs, Computations, FORTRAN, Theses.
Identifiers: IBM-370/168 computers, FORTRAN 4 programming language, Collocation method.

Three acoustic radiation problems concerning axisymmetric radiating spheres with mixed boundary conditions on their surfaces have been treated numerically. They are: first, a radially vibrating polar cap mounted on an otherwise rigid spherical baffle; second, the same cap mounted on an otherwise pressure release spherical baffle; and third, the same cap and a contiguous pressure release belt, both mounted on an otherwise rigid spherical baffle. The solution of the first problem is obtainable in terms of eigenfunctions which are orthogonal over the sphere and is consequently well known; it was thus used as a comparison check for the second and third problem. The solutions of the above problems were accomplished by assuming a Fourier-Legendre series expansion of the acoustic pressure field and numerically determining the coefficients in the expansion, either by the least mean square error method, or by boundary collocation. The first and second problems were solved by both methods, while the third was treated by the least mean square error method only. The numerical computations were performed on an IBM 370/168 digital computer in FORTRAN IV.

AD-A027 537/6GA PC$4.00/MF$3.00
New York Univ N Y Courant Inst of Mathematical Sciences
High Frequency Asymptotics for the Scattering Matrix and the Inverse Problem of Acoustical Scattering.
Andrew Majda. Nov 75, 31p
Grant DAHC04-75-G-0149
Availability: Pub. in Communications on Pure and Applied Mathematics, v29 p261-291 1976.

Descriptors: *Asymptotic series, *Acoustic scattering, Convex bodies, Laplace transformation, High frequency, Equations, Reprints.
Identifiers: Inverse problems, S matrix.

No abstract available.

AD-A027 577/6GA PC$4.00/MF$3.00
Westinghouse Oceanic Div Annapolis Md
Nonlinear Scaling Laws for Parametric Receiving Arrays. Part I. Theoretical Analysis,
F. H. Fenlon, and J. W. Kesner. 30 Jun 76, 48p
Contract N00039-75-C-0259, ARPA Order-2910
Prepared in cooperation with Pennsylvania State Univ., State College. Applied Research Lab. See also Part 2, AD-A027 578.

Descriptors: *Acoustic arrays, *Parametric amplifiers, *Scaling factors, *Acoustic waves, Wave propagation, Amplitude modulation, Plane waves, Carrier waves, Nonlinear systems.

Following a review of the literature on Parametric Receiving Arrays, the problem of defining their performance characteristics under saturated and unsaturated conditions is considered. Basically, the problem is resolved by establishing equations for the axial field of a spatially symmetric pump wave in the spectral domain via Kuznetsov's nonlinear paraxial wave equation. As a biproduct of this analysis, a simplification of terms involving the phase of pump wave in these equations results, upon transformation to the time domain, in a new form of Burgers' equation for a plane piston projector. Unlike previous forms of Burgers' equation, the latter combines the effect of wave interactions in the near and far field regions of the source. Numerical comparisons of the more complete spectral equations and the spectral form of the new Burgers' equation are shown to be in good agreement with experimental results previously reported in the literature. Approximate solutions of these equations are also derived. The three methods thus established for representing the pump field are then used to derive scaling laws for parametric receiving arrays, which clearly shown the limiting effect of pump wave saturation upon the conversion efficiency of the up-conversion process as the pump amplitude is increased indefinitely. (Author)

AD-A027 578/4GA PC$5.50/MF$3.00
Westinghouse Oceanic Div Annapolis Md
Nonlinear Scaling Laws for Parametric Receiving Arrays. Part II. Numerical Analysis,
J. W. Kesner, and F. H. Fenlon. 30 Jun 76, 120p
Contract N00039-75-C-0259, ARPA Order-2910
Prepared in cooperation with Pennsylvania State Univ., State College. Applied Research Lab. See also Part 1, AD-A027 577.

Descriptors: *Acoustic arrays, *Parametric amplifiers, *Scaling factors, *Computer programs, *Numerical analysis, Acoustic waves, Wave propagation, Amplitude modulation, Plane waves, Carrier waves, Nonlinear systems.

This report outlines the procedures used in a computer program for calculating nonlinear scaling laws for parametric receiving arrays. The basic equations, the program input and output, the program listing, and sample computer runs are included. The program output is in the form of curves for harmonic amplitudes as a function of range, the 'extra dB loss' as a function of range, and parametric receiving array beam patterns at given ranges. Both detailed analytical solutions and approximate solutions are available in the computer program. (Author)

AD-A027 586/7GA PC$5.00/MF$3.00
Pennsylvania State Univ University Park Applied Research Lab
Evaluation of a Reverberation Model with Multiple Boundary Reflections.
Master's thesis,
Chih-Liang Chin. 30 Mar 76, 88p Rept no. TM-76-80
Contract N00017-73-C-1418

Descriptors: *Underwater sound, *Reverberation, *Sonar, Backscattering, Mathematical models, Numerical analysis, Shallow water, Theses.

A reverberation model was modified to allow the sea surface backscattering strength to vary with grazing angle, wind speed and frequency. The total reverberation predicted by the model was favorably compared with experimental data obtained in deep ocean water. A modification to incorporate grazing angle and bottom type into the basic model provided only a rough estimate of the reverberation generated by the sea bottom in shallow water. To investigate the possible effects of multiple propagation paths in shallow water, four additional reflection paths were investigated. As considered in the model, these paths did not contribute to the overall reverberation level calculated in shallow water. The sensitivity of the acoustic beam pattern on the reverberation level was also investigated. In the case of single backscattering the minor lobes of the pattern could be identified. This was not possible for multiple reflections.

AD-A027 650/1GA PC$3.50/MF$3.00
Texas Univ At Austin Applied Research Labs
Nonlinear Distortion in the Propagation of Intense Acoustic Noise,
F. M. Pestorius, and D. T. Blackstock. Mar 73, 15p AFOSR-TR-76-0925
Contract F44620-71-C-0015
Sponsored in part by Office of Naval Research, Arlington, Va. Pub. in Proceedings of Interagency Symposium on University Research in Transportation Noise (1st), Stanford Univ., 28-30 Mar 73 v2 p565-577 1973.

Descriptors: *Sound transmission, *Noise(Sound), *Distortion, Plane waves, Shock waves, Acoustic attenuation, Nonlinear systems.
Identifiers: Nonlinear acoustics.

As sound pressure increases to 'finite' levels, nonlinear effects usually ignored in acoustics problems become increasingly important. In this paper plane waves propagating through a pipe are considered. In the first section the distortion of a wave that is sinusoidal at the source is treated. In the second section the source signal is a pulse band-limited (500 to 3500 Hz) random noise. In both cases theoretical results are compared with experimental measurements. Extension of the analysis to the more practical case of outdoor propagation is indicated.

AD-A027 657/6GA PC$4.00/MF$3.00
Naval Underwater Systems Center New London Conn New London Lab
A Synopsis of Studies on the Interaction of Low Frequency Acoustic Signals with the Ocean Bottom.
Technical document,
Salvatore R. Santaniello, Frederick R. DiNapoli, Robert K. Dullea, and Peter D. Herstein. 30 Jun 76, 44p Rept no. NUSC-TD-5337

Descriptors: *Underwater sound signals, *Echo ranging, Sonar signals, Low frequency, Bottom bounce, Ocean bottom, Propagation, Losses, Mathematical models, Mathematical prediction, Sediments, Refraction, Reflection, Interactions.
Identifiers: Deconvolution analysis.

Understanding the mechanisms by which the ocean sediment redirects impinging sound back into the ocean is necessary in developing propagation models for SONAR performance prediction. Thus, NUSC has (1) conducted controlled, self-calibrating acoustic measurements where the bottom interacted signal is isolated in time for analysis, (2) developed deconvolution processing techniques to aid in describing the impulse response of the ocean sediment and (3) performed modeling to study the interaction of acoustic waves at the ocean bottom. This document presents a synopsis of the studies primarily showing the necessity to consider the refraction of sound by the ocean sediment when predicting low frequency propagation loss. Sediment refraction of sound and reflection of sound by the sediment interface and subbottom layering are the causes for the negative bottom loss phenomenon and for a given frequency bandwidth dependence and receiver depth dependence of bottom loss. Deconvolution analyses have aided in time resolution of intrapulse signals that make up the bottom interacting arrivals. Resolution of these arrivals aids in interpreting results. The FFP modeling effort provides quantitative evidence for the necessity to consider the refraction of sound by the ocean sediment to properly interpret low frequency propagation loss measurements in areas where the ocean bottom plays an important part. (Author)

20B. Crystallography

N76-25384/8GA Not available NTIS
Kernforschungszentrum, Karlsruhe (West Germany). Inst. fuer Material- und Festkoerperforschung
Thermal Lattice Dilatation of Some Transition Metal Compounds.
C. Politis. Aug 75, 98p KFK-2168
In German; English Summary.

Descriptors: *Crystal lattices, Elongation, *Lattice parameters, *Thermal expansion, *Transition metals, Carbides, Cubic lattices, Gruneisen constant, Nitrides, Specific heat, X ray diffraction.
Identifiers: Tantalum carbides, Tantalum nitrides, Hafnium carbides, Hafnium nitrides, Crystal structure, Zirconium carbides, Zirconium nitrides, West Germany.

For abstract, see STAR 1416

PB-255 865/8GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
On the Angular Divergence of Out-Going Beams in an Asymmetric Diffraction Geometry.
Final rept.,
Masao Kuriyama, and William J. Boettinger. 1 Dec 75, 3p
Pub. in Acta Crystallographica, vA32 Pt3 p511-512 May 76.

Descriptors: *X ray diffraction, *Crystal structure, Mathematical models.
Identifiers: Reprints.

The well-known relation for the angular divergence of x-ray beams diffracted from a perfect crystal in an asymmetric diffraction condition is derived straightforwardly from first principles.

20D. Fluid Mechanics

AD-A027 165/0GA PC$4.00/MF$3.00
California Inst of Tech Pasadena Guggenheim Jet Propulsion Center
Measurements of Energy Losses Associated with Interactions between Acoustic Waves and a Steady Flow Field.
Rept. for 3 Sep 74-14 Mar 76 on Phase 1,
F. E. C. Culick, and K. Magiawala. May 76, 39p AFRPL-TR-76-22
Contract F04611-75-C-0010

Descriptors: *Acoustic waves, *Nonuniform flow, Cold flow, Energy, Losses, Measurement, Flow fields, Interactions, Vents, Resonance, Tubes, Impedance, Acoustic impedance.
Identifiers: Steady flow field, Impedance Tubes, T burners.

This report covers the first phase of an experimental program devoted to the study of interactions between acoustic waves and non-uniform flow fields. Data have been taken in an impedance tube, and in a resonance tube having the configuration of a T-burner. Results are given for the influence of flow through a subsonic exhaust vent on the decay of acoustic waves in a T-burner. (Author)

AD-A027 188/2GA PC$5.50/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md
A Parametric Survey of Hydrofoil Strut Flutter.
Final rept.,
Peter K. Besch, and Edwin P. Rood, Jr. Jun 76, 113p Rept no. DTNSRDC-76-0050

Descriptors: *Hydrofoils, *Struts, Flutter, Parametric analysis, Vibration, Hydroelasticity, Damping, Bending, Torsion, Hydrodynamics, Model tests, Lift, Cavitation, Ventilation.

In order to explore the fundamental nature of hydrofoil flutter, a hydroelastic instability which is a potential cause of structural failure of lifting surfaces operating at high speeds in water, a series of hydrofoil models was tested in a towing basin. Flutter data were obtained from four surface-piercing hydrofoil strut models with various pod and foil configurations. Flutter occurred in two independent hydroelastic modes having predominantly first bending and first torsion mode shapes, respectively. The unstable modes were found to exist simultaneously in at least one strut. Flutter inception speed of the bending flutter mode was affected by strut submergence and the presence or absence of a foil. Flutter inception speed of the torsional flutter mode was dependent on strut cavitation pattern, strut submergence, pod moment of inertia, pod length, and the presence or absence of a foil. (Author)

AD-A027 231/0GA PC$3.50/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md
Blade Sections and Optimum Pitch Distribution of Supercavitating Propellers.
Research and development rept.,
B. Yim. Dec 75, 24p Rept no. DTNSRDC-4642

Descriptors: *Supercavitating propellers, *Propellers(Marine), Propeller blades, Linear systems, Cascades(Fluid dynamics), Cascade structures, Optimization, Pitch(Inclination), Lift to drag ratio, High velocity, Model tests.

A simple linear method of constructing supercavitating cascade sections of infinite cavities is developed that is similar to the theory previously developed for finite cavities but is much simpler both in theory and computation. In addition, the corresponding drag-to-lift ratio of a section is represented as a function of the lift coefficient so that the drag-to-lift ratio of a section can be readily utilized for optimum pitch distribution of the supercavitating propeller to be designed. A brief method of applying the present theory to the preliminary design of supercavitating propellers is explained. (Author)

AD-A027 247/6GA PC$5.50/MF$3.00
Naval Postgraduate School Monterey Calif
Transverse Forces on Smooth and Rough Cylinders in Harmonic Flow at High Reynolds Numbers.
Master's thesis,
Neil Jon Collins. Jun 76, 106p

Descriptors: *Cylindrical bodies, *Flow fields, *Aerodynamic forces, Lift, Transverse waves, Oscillation, Aerodynamic configurations, Roughness, Reynolds number, Aeroelasticity.
Identifiers: Harmonic flow, Transverse forces, Oscillatory flow, Lift coefficient, Alternating force, Wave force, Keulegan-Carpenter numbers.

The transverse forces acting on smooth and sand-roughened circular cylinders immersed in an harmonically oscillating flow have been measured using a recently constructed U-shaped water tunnel. The lift coefficient and the frequency of the alternating force have been determined. For smooth cylinders, the lift coefficients were found to depend on both the Reynolds and the Keulegan-Carpenter numbers for Reynolds numbers between about 20,000 and 150,000. For rough cylinders, the lift coefficients were found to be independent of the Reynolds number within the range of relative roughnesses and Reynolds numbers tested. The results have also shown that the lift coefficients for smooth cylinders at low Reynolds numbers are nearly identical with those obtained for rough cylinders at very high Reynolds numbers at the corresponding amplitude ratios. For both rough and smooth cylinders, the transverse force is a significant fraction of the in-line force and must be taken into consideration in the design of structures. It is recommended that the experiments be extended to the self-excited hydro-elastic oscillations of cylinders in harmonic flows. (Author)

AD-A027 311/0GA PC$3.50/MF$3.00
California Inst of Tech Pasadena Graduate Aeronautical Labs
Turbulence-Model Predictions for a Flat Plate Boundary Layer,
Doyle Knight. 10 Oct 74, 4p AFOSR-TR-76-0474
Grant AF-AFOSR-2092-71
Availability: Pub. in AIAA Jnl., v13 n7 p945-947 Jul 75.

Descriptors: *Turbulent boundary layer, Equations of motion, Incompressible flow, Flat plate models, Approximation(Mathematics), Skin friction, Pressure gradients, Reprints.

The turbulence model equations of Saffman have been employed to calculate the downstream development of mean flow quantities in a flat plate, zero-pressure-gradient, incompressible turbulent boundary layer. The calculated values of the skin friction agree well with these predicted by Coles' skin friction Law as well as those obtained from the Karman Schoenherr Law at all downstream stations. (Author)

AD-A027 334/2GA PC$3.50/MF$3.00
California Inst of Tech Pasadena Div of Engineering and Applied Science
Cavitation Inception -- A Selective Review,
A. J. Acosta, and B. R. Parkin. 7 Nov 74, 13p
Presented at the American Towing Tank Conference (17th) Pasadena, Calif.
Availability: Pub. in Jnl. of Ship Research, v19 n4 p193-205 Dec 75.

Descriptors: *Cavitation, *Hydrodynamics, Surfaces, Vortices, Polymers, Additives, Experi-

mental data, Geometric forms, Reviews, Reprints.
Identifiers: *Cavitation inception, Model basins.

This paper reviews recent developments in selected cavitation research areas which have been active mainly within the past two years. The new understanding resulting from this work is summarized. Research topics discussed are cavitation inception on smooth surfaces, on vortex cavitation and scaling, on the measurement of cavitation nuclei, and on the effects of polymer additives. Because of the selective nature of the review, a fairly comprehensive listing of recent contributions to the literature on these and related aspects of cavitation research is an essential part of the exposition. (Author)

AD-A027 381/3GA PC$4.00/MF$3.00
Grumman Aerospace Corp Bethpage N Y Research Dept
Free Stream Velocity Measurements in a Supersonic Impulse Flow Field.
Research memo.,
Richard C. Jenkins, and Wayne L. Konopka. May 76, 34p Rept no. RM-168

Descriptors: *Fluid flow, *Supersonic characteristics, *Jet engine exhaust, *Laser velocimeters, Measurement, Doppler systems, Simulators, Impulse loading, Lasers, Test methods, Test equipment, Flow visualization, Ramjet engines.
Identifiers: Laser anemometers, Detonation tubes, Scramjets.

Measurements of free stream flow velocity were made in a detonation tube facility using a laser anemometer. Velocities were obtained close to the exit plane of a two dimensional nozzle under flow conditions that duplicated a hydrogen-air scramjet engine exhaust. The nozzle exit velocity was predicted by a method of characteristics solution that included real gas effects. Our velocity measurements agreed within a few percent with the predicted value (2200 meters/sec). In addition, the authors were able to determine the velocity of cold gases leaving the nozzle after diaphragm rupture but before ignition of the detonation wave. Measured cold gas velocities agreed closely with ideal gas predictions based on direct expansion of the unburned reactant gases. From this investigation it was concluded that, with minor modifications of the laser anemometer system described, free stream velocities up to about 3000 m/sec can be measured as a function of time in downstream regions of the flow field during routine detonation tube operation. This system could be modified to obtain velocity measurements above 5000 m/sec.

AD-A027 465/4GA PC$4.00/MF$3.00
National Aeronautical Establishment Ottawa (Ontario)
Drop Size and Rate of Production from a Spinning Disc,
A. M. Drummond. Apr 76, 50p NAE-LR-590, NRC-15338
Also pub. as ISSN-0077-5541.

Descriptors: *Disks, *Spinning(Motion), *Drops, Fluid dynamics, Fluid flow, Flow rate, Flow visualization, Canada.
Identifiers: Drop formation.

New experimental results on the primary drop size (dp) and rate of drop production are presented. The effects of flow rate (Q), kinematic viscosity (nu) and disc spin rate (omega) on dp were measured. It is concluded that dp = do(nu,Q) = constant/omega. The detached volume has been measured as a function of Q, nu and omega. Both the volume in the primary drop and the detached volume exceed the maximum critical volume of a static pendant drop. This indicates that the dynamics of drop formation must be included when attempting to formulate a predictive model for drop size. The Walton and Prewett model for drop size estimation from a spinning disc is critically examined.

AD-A027 497/7GA PC$3.50/MF$3.00
Aerospace Corp El Segundo Calif Aerophysics Lab
Pitot Pressure Profile Measurement at the Exit of Very Small Nozzles.
Interim rept.,
Robert L. Varwig, Donald A. Durran, and Shaowen W. Liu. 4 Jun 76, 16p TR-0076(6240-10)-3, SAMSO-TR-76-118
Contract F04701-75-C-0076

Descriptors: *Wind tunnel nozzles, Pressure, Boundary layer, *Boundary layer flow, Conical bodies, Aerodynamic configurations, Profiles, Contours, Measurement, Probes, Interactions, Pitot tubes.
Identifiers: Pitot pressure, Very small nozzles.

Pitot pressure profile measurements at the exit plane of a nozzle are used to characterize the flow properties of nozzles. For very small nozzles, where the boundary layer is a singificant part of the nozzle, the pitot pressure profile obtained when the probe is traversed across the nozzle exit displays peculiar properties. Close to the nozzle exist, at the edge of the nozzle, there are sharp peaks in the profile, and there is a lower pressure on the centerline than closer to the wall. The former effect is attributed to flow separation caused by the traversing probe, which is large relative to the scale of the flow nonuniformities, as in the case of a forward facing step. The latter effect is caused by the boundary layer, which changes the effective contour of the nozzle wall. In the 0.060-in.-diam conical nozzle of this study, the boundary layer changed the shape from conical to that approximating the first third of a Mach 6 contoured nozzle. (Author)

AD-A027 524/8GA PC$7.75/MF$3.00
Systems Research Labs Inc Newport News Va Rasa Div
An Experimental Investigation of Vortex Flow Control for High Lift Generation.
Interim rept. 1 Jan-31 Dec 75,
Richard P. White, Jr., and John C. Balcerak. Dec 75, 210p RASA/SRL-14-76-2, ONR-CR212-223-2
Contract N00014-74-C-0091
See also report dated Jul 75, AD-A014 088.

Descriptors: *Vortices, *Lifting surfaces, *High lift, Aerodynamic characteristics, Control systems, Experimental data, Swept wings, Aspect ratio, Model tests, Wind tunnel tests, Interactions, Flow fields, Performance tests.
Identifiers: Low aspect ratio, Post stall investigations, Wing vortex interactions, Recommendations.

An experimental research program was conducted to investigate methods of improving the performance characteristics of low-aspect ratio, swept-wing surfaces in the post-stall region. Wind tunnel tests were conducted with an unmodified wing panel and with snags, strakes and combinations thereof affixed to the panel. The prediction of changes in the performance characteristics by simplified theoretical analyses is discussed with regard to the observed complexity of the flow field produced by the vortex generators.

AD-A027 540/4GA PC$3.50/MF$3.00
Stevens Inst of Tech Hoboken N J Dept of Mechanical Engineering
Numerical Computation of Nonstationary Aerodynamics of Flat Plate Cascades in Compressible FLow,
F. Sisto, and R. H. Ni. 1976, 6p Rept no. ME-RT-76002
Contracts N00014-76-C-0540, N00014-67-A-0202
Presented at the Gas Turbine Conference of the American Society of Mechanical Engineers, 2-6 Mar 75 Houston, Tex.
Availability: Pub. in Jnl. of Engineering for Power, v98 n2 p165-170 Apr 76.

Descriptors: *Aeroelasticity, Compressible flow, Flat plate models, Vibration, *Turbine blades, Two dimensional flow, Flutter, Cascades(Fluid dynamics), Reprints.

The nonstationary subsonic or supersonic aerodynamics of a flat plate cascade for compressible flow is studied. The 'Time marching' technique is applied to obtain numerical results. Two-dimensional flow for any interblade phase angle is considered. In the new method used for the boundary conditions, the order of accuracy for the boundary points will be the same as the interior points. The wake regions behind the blades are treated as 'slip planes'. The results obtained are in accord with the analytical solutions. (Author)

AD-A027 588/3GA PC$5.50/MF$3.00
Arnold Engineering Development Center Arnold Air Force Station Tenn
Analytical, Numerical, and Experimental Results on Turbulent Boundary Layers.
Final rept. Sep 74-Jan 75,
David L. Whitfield. Jul 76, 101p Rept no. AEDC-TR-76-62
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn. Rept. no. ARO-PWT-TR-75-132.

Descriptors: *Turbulent boundary layer, *Fluid mechanics, Mathematical analysis, Experimental data, Numerical methods and procedures, Laminar flow, Kinetic energy, Correlation techniques, Walls, Velocity, Thermal properties, Prandtl number, Reynolds number, Data reduction, Wind tunnel tests, Computer applications.
Identifiers: Reynolds stress.

This report describes the results of analytical, numerical, and experimental investigations of incompressible and compressible boundary layers. The subjects considered are (1) Laminar and/or turbulent numerical boundary-layer calculations in which the Reynolds stress is related to the turbulent kinetic energy; (2) an analytical investigation of turbulence near a wall which is not founded on classical mixing-length theory; (3) analytical solutions for relating velocity and temperature throughout turbulent boundary layers for nonunity Prandtl numbers; (4) a description of the data reduction of pitot pressure measurements utilizing these analytical results, and (5) the application of the numerical and analytical results to the analysis of turbulent boundary-layer measurements made in the Propulsion Wind Tunnel Facility (PWT).

AD-A027 597/4GA PC$3.50/MF$3.00
Pennsylvania State Univ University Park Applied Research Lab
A Note on the Inhibition of Cavitation in Dilute Polymer Solutions.
Technical memo.,
R. E. A. Arndt, M. L. Billet, J. W. Holl, and C. B. Baker. 13 Nov 75, 15p Rept no. TM-75-285
Contract N00017-73-C-1418
Presented at the Joint Fluids Engineering and Gas Turbine Conference, 21-25 Mar 76, New Orleans, La.

Descriptors: *Cavitation, *Polymers, *Hemispheres, *Noses, Laminar flow, Orientation(Direction), Flow fields, Separation, Water tunnels, Inhibition, Additives, Drag reduction.
Identifiers: Desinent cavitation, *Drag reducing fluids.

Cavitation inception was investigated on a series of hemispherical nosed bodies rangine in

diameter from 6.3 mm (1/4 inch) to 203.2 mm (8 inches) in both pure water and dilute aqueous polymer solutions. The desinent value of cavitation index is reduced by as much as 50% on the smaller bodies but the polymer effect is almost negligible on the largest body. There is strong evidence that the favorable effect of polymer addition is due to a reorientation of the flow field near a laminar separation bubble. It is further noted that the effect is probably limited to Reynolds numbers typical of laboratory experiments and would not exist at full scale conditions.

AD-A027 651/9GA PC$3.50/MF$3.00
Illinois Inst of Tech Chicago Dept of Mechanics Mechanical and Aerospace Engineering
Relative Spreading and Structure of Coupled Turbulent Thermal and Velocity Fields.
Final rept. Jan 73-Dec 75,
John W. Way. Jun 76, 15p AFOSR-TR-76-0929
Grant AF-AFOSR-2509-73

Descriptors: *Fluid dynamics, *Thermal analysis, *Flow fields, Gas flow, Liquids, Blunt bodies, Turbulent flow, Thermal properties, Velocity, Wake, Films, Data acquisition, Data processing, Interactions, Temperature, Tracer studies, Laminar flow, Measurement, Cylindrical bodies.
Identifiers: Velocity fields, Near wake, Coupled flow fields.

Brief descriptions of research accomplished under the grant 'Relative Spreading and Structure of Coupled Turbulent Thermal and Velocity Fields' are presented in nine categories: (a) data acquisition and processing, (b) interaction of a cold and a lukewarm wake, (c) metallic films for thermal tracing, (d) point-source thermal tracer techniques, (e) dynamic temperature compensation for hot-films, (f) effect of upstream laminar wakes on blunt bodies, (g) response of split- and hot-films, (h) differential temperature measurements, and (i) circular cylinder near wake. The techniques of thermal tracing, resistance thermometry, temperature compensation, digital data acquisition and processing, conditional sampling and averaging, and phase detection and averaging are developed and combined in the experimental investigation of three fluid mechanical problems.

AD-A027 688/1GA PC$4.50/MF$3.00
Princeton Univ N J Dept of Aerospace and Mechanical Sciences
Research on Hypersonic Aerodynamics.
Final rept. 1 Jan 71-31 Dec 75,
S. M. Bogdonoff, F. R. Hama, S. H. Lam, J. A. Smith, and I. E. Vas. 5 May 76, 69p AFOSR-TR-76-0812
Contract F44620-71-C-0032

Descriptors: *Hypersonic flow, *Ionized gases, Turbulent boundary layer, Interactions, Three dimensional flow, Scientific research, Flow fields.

The theoretical and experimental studies carried out by the Gas Dynamics Laboratory as part of its long range research in hypersonic flows have been summarized for the period 1 January 1971-31 December 1975. These studies provide some fundamental and some practical insights into real flow phenomenon observed in nature and in flight. Some of the studies have been completed, others require further work to fully understand them or to limit the range of applicability of available theories. (Author)

AD-A027 717/8GA PC$4.00/MF$3.00
Aeronautical Research Associates of Princeton Inc N J
Interactions and Merging of Line Vortices.
Final rept. 1 Jan-31 Dec 75,
Alan J. Bilanin, Richard S. Snedeker, and Milton E. Teske. Feb 76, 47p ARAP-276, AFOSR-TR-76-0873
Contract F44620-75-C-0051

Descriptors: *Vortices, *Coalescence, Interactions, Turbulent flow, Shear properties, Wake, Aircraft, Flow visualization, Mathematical analysis, Wind tunnel tests, Subsonic characteristics, Airfoils.
Identifiers: *Vortex merging, *Vortex interactions, Shear layers.

The results of a theoretical and experimental study of the interactions between adjacent line vortices are presented. Particular emphasis is given to the process of merging or pairing in which two vortices of like sign coalesce to form a single vortex. Merging is discussed in terms of its importance to the growth and aging of turbulent shear layers and aircraft wakes. Flow visualization experiments are described in which merging was observed by means of smoke injected into a wind tunnel flow. Vortex pairs of like sign and equal strength, varying sign and strength, and opposite sign and equal strength were studied. Good qualitative agreement is found between the observed flow patterns and those calculated by means of a computer code.

AD-A027 739/2GA PC$4.00/MF$3.00
Lehigh Univ Bethlehem Pa Center for the Application of Mathematics
Flow of a Viscoelastic Fluid Between Eccentric Rotating Cylinders,
B. Y. Ballal, and R. S. Rivlin. 31 Aug 75, 38p ARO-12381.3-M
Grant DAHC04-74-G-0176
Availability: Pub. in Transactions of the Society of Rheology, v20 n1 p65-101 1976.

Descriptors: *Fluid flow, *Viscoelasticity, Viscous flow, Velocity, Cylinders, Rotation, Eccentricity, Reprints.
Identifiers: Rivlin Ericksen equations, Annular flow.

The flow of a viscoelastic fluid in the annular region between two infinite, eccentrically-mounted, rotating cylinders is analyzed. The flow is assumed to be sufficiently slow, so that the second-order Rivlin-Ericksen constitutive equation is applicable and so that inertial effects may be neglected. The resultant forces on the cylinders, as well as the distribution of their normal and tangential components, are calculated. No restrictions are placed on the ratio of the radii or on the distance between the cylinder axes. (Author)

N76-25147/9GA PC$3.50/MF$3.00
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A One-Equation Model of Turbulence for Use with the Compressible Navier-Stokes Equations.
M. W. Rubesin. Apr 76, 22p NASA-TM-X-73128, A-6570

Descriptors: *Compressible flow, *Flow equations, *Navier-stokes equation, *Turbulence, Boundary layers, Numerical analysis, Turbulent flow.

For abstract, see STAR 1416

N76-25148/7GA PC$4.50/MF$3.00
Texas Univ., Austin. Dept. of Aerospace Engineering and Mechanics.
An Experimental Investigation of Supersonic Flow past a Wedge-Cylinder Configuration.
D. W. Barnette. Apr 76, 63p NASA-CR-147741, AER-76002
Contract NAS9-13707

Descriptors: Cylindrical bodies, *Supersonic flow, *Wedges, Aerodynamic configurations, Leading edges, Supersonic heat transfer.

For abstract, see STAR 1416

N76-25522/3GA PC$3.50/MF$3.00
Scientific Translation Service, Santa Barbara, Calif.
Thermocapillary Drift of a Viscous Fluid Droplet.
Y. K. Bratukhin. Jun 76, 12p NASA-TT-F-17093
Contract NASW-2791
Tran-Transl. into English from Izv. Akad. Nauk Sssr, Mekhanika Zhidkosti I Gaza (Ussr), Sep. - Oct., 1975 p 156-161.

Descriptors: *Capillary flow, *Drift rate, *Drops (Liquids), *Mobility, *Thermohydraulics, *Viscous fluids, Convection, Oseen approximation, Shear stress, Temperature gradients, Weightlessness.
Identifiers: Translations, USSR.

For abstract, see STAR 1416

N76-25523/1GA PC$4.00/MF$3.00
Applied Research Lab., State College, Pa.
Correlations by the Entrainment Theory of Thermodynamic Effects for Developed Cavitation in Venturis and Comparisons with Ogive Data.
M. L. Billet, J. W. Holl, and D. S. Weir. 11 Dec 75, 42p NASA-CR-135018, ARL-TM-75-291
Contract NGR-39-009-001

Descriptors: *Entrainment, *Thermodynamic properties, *Venturi tubes, *Cavitation flow, Ogives, Temperature measurement, Theorems.

For abstract, see STAR 1416

N76-25524/9GA PC$4.00/MF$3.00
Technische Hogeschool, Delft (Netherlands). Abteilung fuer Maschinenbau.
Memory Effects in Turbulence.
J. O. Hinze. Sep 75, 30p WTHD-75
In German; English Summary.

Descriptors: *Nonnewtonian fluids, *Turbulent flow, *Viscoelasticity, Eddy viscosity, Flow distribution, Turbulent boundary layer, Velocity distribution, Wakes.
Identifiers: Netherlands.

For abstract, see STAR 1416

N76-25528/0GA Not available NTIS
Instituto de Energia Atomica, Sao Paulo (Brazil).
Void-Fraction Measurement in a Two-Phase Air-Water Flow in a Vertical Tube.
R. E. F. Demello, M. R. Behar, and E. W. Martines. Jan 75, 29p IEA-378
Language in Portugese.

Descriptors: *Pipe flow, *Void ratio, Radioactive isotopes, Trace elements.
Identifiers: Brazil.

For abstract, see STAR 1416

PB-255 645/4GA PC$10.00/MF$3.00
United States-Israel Binational Science Foundation.
Convective Stability of Incompressible Fluids.
1976, 337p TT-75-50017, ISBN-0-7065-1562-5
Trans. of mono. Konvektivnaya Ustoichivost Neszhimaemoi Zhidkosti, Moscow, 1972, by D. Louvish. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Hydrodynamics, *Incompressible flow, *Thermodynamic properties, Stability,

Convection, Nonuniform flow, Equilibrium, Disturbances, Layers, Cavities, Magnetic fields, Mixtures, Vibration, Equations of motion, Porous materials, Secondary flow, Translations, USSR.
Identifiers: *Hydrodynamic instability, Vertical flow.

When a fluid in the field of gravity is heated nonuniformly, a mechanical equilibrium may form under certain conditions. If the temperature is markedly nonuniform, the equilibrium becomes unstable and the resulting disturbances produce convective motion. On the other hand, if conditions are such as to make equilibrium impossible, convection will set in, however small the temperature nonuniformity. In this case too, the increase of temperature difference leads to a crisis due to the instability of the convective motion itself. Both of the above situations represent special cases of one of the most interesting phenomena in modern hydrodynamics: hydrodynamic instability. Copyright (c) Keter Publishing House Jerusalem Ltd. 1976

PB-255 880/7GA PC$4.00/MF$3.00
Illinois Univ. at Urbana-Champaign. Dept. of Theoretical and Applied Mechanics.
Pulse Propagation in Fluid-Filled Tubes,
J. S. Walker, and J. W. Phillips. Nov 75, 30p
T/AM-404, UILU-ENG-75-6007
Grant NSF-ENG-74-23778

Descriptors: *Pipe flow, *Elastic waves, Pulsation, Pressure, Water hammer, Theory, Inviscid flow, Compressible flow, Tubes, Elasticity, Thin wall pipes, Force, Capping, Water flow, Dynamic tests.
Identifiers: *Pressure pulses, Elastic tubes.

A new theory for the propagation of pressure pulses in an inviscid compressible fluid contained in a thin-walled elastic tube is presented. It represents an improvement over the classical waterhammer theory because the restriction that the speed of sound in the tube material must be much greater than that in the fluid has been removed and because the restriction that the pulse length must be much greater that the tube diameter has been somewhat relaxed. The new theory is applied to a capped tube with an axial impulsive force applied to the capped end for a short period. Numerical solutions using the method of characteristics are presented for a water-filled copper tube and for two different pulse lengths. An analytical solution is obtained for the special case when the speeds of sound in the tube material and fluid are equal.

20E. Masers and Lasers

AD-A027 152/8GA PC$5.00/MF$3.00
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
Comparative Analysis of Birefringent Tuning Devices for Dye Lasers.
Master's thesis,
Donald E. Lumpkin. Jun 76, 96p Rept no. GEO/PH/76J-5

Descriptors: *Dye lasers, *Tuning devices, Filters, Laser cavities, Birefringence, Quartz, Calcite, Insertion loss, Theses.
Identifiers: Organic dye lasers.

Lasers can be made using organic dyes as the lasing medium. The output signal for such a laser covers a large spectral range. When a frequency selective device is inserted in the lasing cavity, the output signal can be narrowed without loss of output power. If the passband of the intracavity device is variable a tunable laser can be produced. In search of a simple highly-transparent tuning device, four birefringent filters using various tuning techniques have been analyzed and compared. Three of the filters use a combination of linear polarizers and retardation plates to produce a tunable output. The fourth device, called a tilted plates filter, uses only retarders. The retarders are inserted in the lasing cavity at Brewster's angle so as to form a partial polarizer. The criteria used for comparing the devices are insertion loss, resistance to optical damage, and simplicity. All of the filters are satisfactory with respect to optical damage having a damage threshold on the order of 1 gigawatt/sq cm. With respect to the other two criteria, the tilted plates filter is found to be superior. To produce a filter with a 10A lasing bandwidth and a 600A tuning range, two retarders are required. For tuning, these retarders are rotated so as to maintain the Brewster angle orientation with the laser axis. The insertion loss for the tilted plates filter is only 0.04% per pass when the filter is made using calcite and 2.3% per pass when quartz is used. The thin crystals required render a calcite filter impractical. (Author)

AD-A027 168/4GA PC$4.00/MF$3.00
Hughes Research Labs Malibu Calif
Excimer Lasers.
Semiannual technical rept. no. 3, 1 Oct 75-31 Mar 76,
A. Jay Palmer, and L. D. Hess. Jun 76, 50p
Contract N00014-75-C-0081, DARPA Order-1807

Descriptors: *Gas lasers, *Alkali metals, *Rare gases, *Dimers, Potassium, Xenon, Argon, Mixtures, Diatomic molecules, Electric discharges.
Identifiers: *Excimer lasers, Dimer lasers, Continuum lasers.

The primary goals of this program are to identify specific operating conditions for achieving laser oscillation on the A to X transitions of the diatomic alkali-rare gas excimer molecules (excimers) and of the diatomic homonuclear alkali molecule (dimers) and to demonstrate net laser gain in a laboratory experiment from at least one of the alkali-rare gas systems. The phase of the program covered by this report was devoted to experiments and theoretical modeling on discharge pumping of the potassium-xenon and potassium-argon excimer-dimer systems. A time dependent discharge model was developed and is being used to predict discharge and stimulated emission characteristics of a pulsed transverse discharge through potassium-argon and potassium-xenon mixtures. Modeling results show stable discharge operation under conditions which yield a practical laser gain coefficient on both the K-Xe and K-Ar excimer bands and on the K2 dimer band.

AD-A027 212/0GA PC$5.50/MF$3.00
Iic Technology Inc Sunnyvale Calif
Production Engineering Measure for Optical Pumps for Lasers.
Final engineering rept. Jun 73-Aug 75,
Robert Maynard. 15 Jul 76, 112p Rept no. R-iLC-73-22/F
Contract DAAB05-73-C-2078

Descriptors: *Lasers, *Optical pumping, *Flash lamps, Production engineering, Fabrication, Performance tests, Xenon lamps, Test equipment, Fluorescence, Integrated circuits, Output, Digital systems, Data processing.
Identifiers: Production engineering measures, Neodymium YAG lasers, Design.

This program was directed toward establishing a capability for manufacturing fluid cooled and compressed gas cooled flashlamps to be used as optical pumps for Nd:YAG laser systems. Work on fluid cooled flashlamps was terminated early in the program. Flashlamps were designed, fabricated, and tested for specific electrical and optical characteristics using government-furnished specifications as a guideline. Gas cooled flashlamps constructed with 1.0 mm thick walls of synthetic fused quartz and filled with 450 torr of xenon were deemed most likely to meet the lifetime, triggering, and optical output requirements of the government-furnished specifications. Correlation was demonstrated between direct laser output measurements and the output of a fluorescent monitoring instrument. Automated digital test equipment was implemented for measuring and calculating flashlamp parameters.

AD-A027 356/5GA PC$4.50/MF$3.00
Arizona Univ Tucson Optical Sciences Center
Quarterly Applied Optics Research Report(Third).
Rept. for 1 Jan-31 Mar 76.
1 Apr 76, 51p SAMSO-TR-76-112
Contract F04701-75-C-0248
See also Quarterly Rept. no. 2, AD-A025 283.

Descriptors: *Carbon dioxide lasers, Laser cavities, Optics, Wavefronts, Interferometers, Holography, Gratings(Spectra), Frequency modulation, Refractive index, Ray tracing, Mathematical analysis.
Identifiers: Coupling modulation, Optical wavefronts.

This third quarter status report of the University of Arizona Optical Sciences Center presents results of work in program areas supported entirely or in part by USAF contract FO 4701-75-C-0248. Specifically covered in this report are CO2 laser frequency, gratings, lateral shear interferometers, mathematical optics, and optical wavefronts. Also included is a list of professional publications and activities of Optical Sciences Center personnel. (Author)

AD-A027 510/7GA PC$3.50/MF$3.00
California Univ Berkeley Electronics Research Lab
Picosecond Pulse Generation in Synchronously Pumped Dye Lasers,
Z. A. Yasa, and O. Teschke. 16 Jun 75, 5p
AFOSR-TR-76-0498
Contract F44620-71-C-0087, Grant NSF-GK-37048X
Availability: Pub. in Jnl. of Optics Communications, v15 n2 p169-172 Oct 75.

Descriptors: *Dye lasers, *Laser pumping, Short pulses, Pulse trains, Synchronization(Electronics), Reprints.
Identifiers: Ultrashort pulses.

Synchronously pumped dye lasers are studied. The ultrashort pulse evolution is numerically investigated for a large number of round-trips. A stationary pulse is found. (Author)

AD-A027 546/1GA PC$3.50/MF$3.00
Stanford Univ Calif Edward L Ginzton Lab
Optically Pumped Superfluorescent Na2 Molecular Laser,
M. A. Henesian, R. L. Herbst, and R. L. Byer. 8 Oct 75, 5p GL-2522, AFOSR-TR-76-0705
Contract F44620-74-C-0039
Availability: Pub. in Jnl. of Applied Physics, v47 n4 p1515-1518 Apr 76.

Descriptors: *Molecular lasers, *Optical pumping, *Infrared lasers, Near infrared radiation, Gain, Intensity, X band, Yag lasers, Neodymium lasers, Q switching, Photons, Sodium, Reprints.
Identifiers: *Sodium lasers.

Optically pumping an Na2 molecule at 0.473 and 0.659 micrometers resulted in superfluorescent laser emission on a series of green and yellow molecular B-X-band transitions and laser oscillation in the near infrared on A-X band transitions. Pump saturation, laser gain, and laser saturation intensity are reported.

AD-A027 630/3GA PC$6.00/MF$3.00
Rockwell International Canoga Park Calif Rocketdyne Div
Chemical Laser Advanced Nozzle Development.
Final rept.,
R. A. Dickerson, L. J. Zajac, and S. C. Hurlock. Jun 76, 148p R-9887, AFWL-TR-76-45
Contract F29601-73-A-0034-0005

Descriptors: *Chemical lasers, *Nozzles, Fluorine, Fuels, Diluents, Turbulent flow.
Identifiers: Hydrogen fluoride lasers, Deuterium fluoride lasers.

This report describes experimental and analytical efforts conducted to develop a new chemical laser nozzle concept, the tri-stream (or three-stream) chemical laser nozzle. This nozzle expands the cavity fuel and the fluorine atom (combustor effluent) flows through the same nozzle. The fluorine and cavity fuel streams are separated by a layer of diluent flow to inhibit intermixing and reaction of the fluorine atom and cavity fuel in the nozzle. These three streams (fluorine atom, diluent, and cavity fuel) form a basic unit, or element, of the device, and the number of elements per unit length of nozzle is the most important parameter affecting the achievable performance. Tri-stream nozzles were designed, fabricated, and tested in 2.5-inch-long by 0.4-inch-high nozzle exit configurations. Laser power tests of the tri-stream nozzles were conducted in a free-jet test facility capable of pumping to cavity pressures as low as 2.5 torr. The maximum specific power achieved with DF* lasing using all helium diluent was slightly in excess of 80 kJ/lb. The maximum DF* specific power achieved with N2 nozzle diluent was approximately 60 kJ/lb.

NTIS/PS-76/0613/0GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Dye Lasers. Volume 1. 1964-1974 (A Bibliography with Abstracts).
Rept. for 1964-74,
Mona F. Smith. Jul 76, 153p*

Descriptors: *Bibliographies, *Dye lasers, *Bibliographies, Design, Performance, Cyanine dyes, Optical pumping, Abstracts, Molecular energy levels.
Identifiers: Laser spectroscopy, Xanthene dyes, Tunable lasers, Mode locked lasers, Continuous wave lasers, NTISNTIS.

Studies on design, tuning, optics, pumping, molecular energy levels and dye laser spectroscopy are presented. In addition reports on modulation, dyes, excitation, power output, stabilization and applications of dye lasers are cited. (This updated bibliography contains 148 abstracts, none of which are new entries to the previous edition).

NTIS/PS-76/0614/8GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Dye Lasers. Volume 2. 1975-June 1976 (A Bibliography with Abstracts).
Rept. for 1975-Jun 76,
Mona F. Smith. Jul 76, 104p*
Supersedes NTIS/PS-75/539, NTIS/PS-74/120, COM-73-11579, and NTIS-Pk-15.

Descriptors: *Bibliographies, *Dye lasers, Design, Development, Performance evaluation, Optical pumping, Optical communication, Excitation, Frequency modulation, Optical radar, Tests, Abstracts.
Identifiers: Organic dye lasers, Tunable lasers, Laser spectroscopy, Laser isotope separation.

The citations contain research documents on dye laser design, materials, pumping, tuning, frequency range, testing, modulation and excitation. Studies on dye laser use in laser isotope separation, optical communications and spectroscopy are included. (This updated bibliography contains 98 abstracts, 73 of which are new entries to the previous edition.)

NTIS/PS-76/0620/5GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Gas Dynamic Lasers (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
Kirk G. Werner, and Mona F. Smith. Aug 76, 174p*
Supersedes NTIS/PS-75/573, and NTIS/PS-75/018.

Descriptors: *Bibliographies, *Gas lasers, *Chemical lasers, Carbon dioxide lasers, Gas flow, Energy transfer, Gas dynamics, Molecular relaxation, Diffusion, Design, Performance, Tests, Supersonic nozzles, Abstracts.
Identifiers: *Gas dynamic lasers, Hydrogen fluoride lasers, Deuterium fluoride.

The citations cover research on kinetic and energy transfer processes, design, optics, nozzles and performance of gas and chemical lasers relying on gas dynamic effects for lasing enhancement. Diffusion and flow studies specifically applicable to such lasers are also included. (This updated bibliography contains 174 abstracts, 62 of which are new entries to the previous edition.)

N76-25548/8GA PC$3.50/MF$3.00
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Nasa Atomic Hydrogen Standards Program: An Update.
V. S. Reinhardt, D. C. Kaufmann, W. A. Adams, J. J. Deluca, and J. L. Soucy. Jun 76, 20p NASA-TM-X-71129, X-814-76-127

Descriptors: *Frequency standards, *Hydrogen, Atomic beams, Gas masers.

For abstract, see STAR 1416

PAT-APPL-677 198/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Gas Laser Starting.
Patent Application,
Robert L. Hintz, and Fred L. Rogers. Filed 15 Apr 76, 11p AD-D002 606/2
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Gas lasers, *Carbon dioxide lasers, Electric discharges, Excitation, Airborne, Resistors, Electrodes, High voltage.
Identifiers: *Patent applications, *Electric discharge lasers, PAT-CL-331-94.5.

The invention comprises a non-dissipative starting device for a cross-flow CO2 gas laser for operating at least two electric discharges simultaneously in the laser cavity. The plasma guides between the cathodes and anodes are used as intermediate electrodes. A series of high voltage relays and resistors are placed in parallel with the discharge path between adjacent plasma guides and by switching out pairs of relays, current is coupled to the discharge path, one plasma guide at a time.

PAT-APPL-678 264/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Improved Metal Vapor Laser Tube.
Patent Application,
Myer Geller, Daniel E. Altman, and Glidden J. Barstow. Filed 19 Apr 76, 18p AD-D002 607/0
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Gas lasers, Metal vapors, Discharge tubes, High temperature, Seals(Stoppers).
Identifiers: *Metal vapor lasers, *Patent applications, PAT-CL-331-94.5.

The patent application describes an improved metal vapor laser tube, comprised of an enclosure, preferably in an elongate tubular form, containing an amount of a metallic element. The material of the enclosure is selected to be electrically non-conductive and also for its ability to withstand elevated temperatures of the order of 1000C. The enclosure has at least one window capable of transmitting energy at the wavelength of emission of the metallic element contained within it. Two electrodes, preferably in the form of cylinders, are disposed at opposite ends within the enclosure in coaxial alignment with the major axis of the enclosure. A method of sealing the metallic conductor strip within a substantially tubular extension member is also provided.

20F. Optics

AD-A027 214/6GA PC$7.50/MF$3.00
Rockwell International Anaheim Calif Electronics Group
Optical Waveguide Lenses. I.
Final technical rept. 15 Nov 74-15 Nov 75,
D. B. Anderson, R. L. Davis, J. T. Boyd, R. R. August, and R. E. Eisele. May 76, 200p C74-1187.13/501, AFAL-TR-76-54
Contract F33615-75-C-1017

Descriptors: *Optical lenses, *Optical waveguides, Thin films, Refraction, Reflectors, Luneberg lenses, Telephoto lenses, Dielectric waveguides, Tantalum compounds, Oxides.
Identifiers: Geodesic lenses, Corning 7059 glass, Fourier transforms, Spectrum analyzers.

The results of an effort to develop thin-film waveguide optical elements for implementation of the Fourier transform as may be employed for a real-time RF spectral analyzer is delineated herein. Various types of simple refractors and reflectors for folding are considered in conjunction with a beam expansion telescope and a telephoto lens system. The dispersion properties of multi-layer thin-film dielectric waveguides are considered for use in the implementation of homogeneous and inhomogeneous refractors, reflectors and geodesic lens systems. (Author)

AD-A027 338/3GA PC$3.50/MF$3.00
Illinois Univ At Urbana-Champaign
Light Scattering from Relaxation Modes of Rapidly Diffusing Atoms or Ions,
Miles V. Klein. 1976, 8p AFOSR-TR-76-0669
Contract F44620-75-C-0091
Availability: Pub. in Light Scattering in Solids, p351-355 1976.

Descriptors: *Light scattering, Solids, Crystal lattices, Infrared radiation, Raman spectra, Relaxation, Reprints, Copper compounds, Silver compounds, Iodides, Ions.
Identifiers: *Crystal structure.

In the solid electrolytes a large number of mobile ions move among an even larger number of sites. Similar processes occur in the bcc transition metals, such as Nb, containing interstitial hydrogen atoms. The dwell time at a given site can be extremely short, perhaps 10 to the minus 11th power s at high temperatures, but detailed knowledge about the jump dynamics is not yet available. In this paper it is assumed that the jump time is much shorter than the dwell time and treat only single-particle properties, ignoring all collective effects and vibrational proper-

ties. The hopping response to a weak perturbation can be described in terms of a linear superposition of 'relaxation modes'. If the site geometry in a unit cell of the skeleton crystal lattice is sufficiently complex, there should be 'infrared-active' relaxation modes and 'Raman-active' relaxation modes. Their spectral functions will be Lorentzians centered about zero frequency with widths of order 10 to the 10th power Hz. The 'infrared' modes produce dielectric loss peaks of the Debye type. (Author)

AD-A027 364/9GA PC$4.00/MF$3.00
Air Force Weapons Lab Kirtland AFB N Mex
A Description of the Thermal Distortion Test Facility at the Air Force Weapons Laboratory.
Final rept.,
A. B. Callender, and Raymond H. Bloomer, Jr.
May 76, 41p Rept no. AFWL-TR-76-86

Descriptors: *Mirrors, *Lasers, Distortion, Thermal stresses, Thermal stability, Water cooling, Interferometry, Holography, Hydrostatic pressure, Electron beams.
Identifiers: Test equipment, *Test methods, Laboratories, Test facilities.

The Thermal Distortion Test Facility at the Air Force Weapons Laboratory provides an in-house capability for obtaining interferometric measurements of laser produced thermal distortions in water-cooled mirrors of interest to the Air Force Advanced Radiation Technology program. A rastered electron beam is used to simulate the laser heating. The facility is currently testing mirrors up to 40 cm in diameter and with water flows of up to 45 GPM. Data in the form of 35-mm negatives and video tapes, are reduced to give distortion information with typically a precision of + or - 0.05 micrometer at absorbed power densities in excess of 1 kilowatt/sq cm. This report is a facility description designed in part to give the potential user a basic understanding of the system capabilities and the technical requirements which must be met to prepare for a test. (Author)

AD-A027 632/9GA PC$3.50/MF$3.00
Rome Air Development Center Griffiss AFB N Y
An Optoacoustic Technique for Measuring the Optical Absorption Coefficient in Solids.
Final rept.,
A. Hordvik, H. Schlossberg, H. Miller, and C. Gallagher. Mar 76, 17p Rept no. RADC-TR-76-70

Descriptors: Lasers, Optoacoustic filters, *Optical glass, Piezoelectric transducers, Continuous wave lasers, Acoustic waves, Optical properties, Absorption coefficients, Infrared windows, Light pulses, Zinc compounds, Selenides, Measurement, *Laser materials, Light transmission.
Identifiers: Acoustooptics, *Infrared optical materials, Test equipment, Zinc selenides.

An investigation was made of an optoacoustic technique for determining the optical absorption coefficients in solids. A train of laser pulses was passed through the solid, and the amplitude of the acoustic wave generated by the absorbed radiation was measured by a piezoelectric transducer attached directly to the sample. It was shown theoretically and experimentally that the output voltage from the transducer was proportional to the absorbed energy. The generated voltage per unit of absorbed energy was established by measuring the output voltage at a laser wavelength of known absorption coefficient. This value was then used as a reference to determine the absorption coefficient at other laser wavelengths. Measurements were made on various glasses and potential window materials. Absorption coefficients in the 10 to the -5th power/cm range were measurable with laser input powers of only a few hundred mW. The sensitivity of the technique was limited by the voltage generated by radiation scattered onto the transducer. (Author)

AD-A027 667/5GA PC$3.50/MF$3.00
Stanford Univ Calif Edward L Ginzton Lab
Research Studies on Tunable Optical Parametric Oscillators.
Interim Technical rept. 1 Oct 74-30 Sep 75,
S. E. Harris, and J. F. Young. Jun 76, 21p GL-2534, RADC-TR-76-181
Contract F19628-75-C-0046

Descriptors: *Frequency converters, Light sources, *Tunable lasers, Two photon absorption, Metal vapors, Infrared images, Optical pumping, Coherent radiation.
Identifiers: *Infrared upconverters, Optical parametric oscillators, Metal vapor lasers.

The primary goal of this contract is research studies of tunable optical sources, and the development of coherent sources in new spectral regions. In particular, a major project this year has been IR image up-conversion based on three frequency summing in metal vapors. A general theory of the efficiency of these up-converters as a function of the pump laser spectrum, detuning, and linewidth, and of the linewidth of the selected non-allowed atomic transition has been developed. (Author)

AD-A027 747/5GA PC$3.50/MF$3.00
California Inst of Tech Pasadena
On Transmission and Recovery of Three-Dimensional Image Information in Optical Waveguides,
Amnon Yariv. 21 Aug 75, 7p AFOSR-TR-76-0752
Grant AF-AFOSR-2874-76
Availability: Pub. in Jnl. of the Optical Society of America, v66 n4 p301-306 Apr 76.

Descriptors: *Optical waveguides, Facsimile transmission, *Optical communications, *Fiber optics, Three dimensional, Pictures, Optical images, Propagation, Nonlinear propagation analyses, Reprints.
Identifiers: Optical mixing, Nonlinear optics.

The paper considers two questions. The first one is: Is it possible to transmit three-dimensional pictorial information through transparent glass (or other dielectric) fibers. It is found that due to modal dispersion, pictorial information is invariably 'smeared' in transmission. The second question is: Given nature's reluctance to transmit pictures through fibers, is there anything we can do about it. It is suggested that the answer is yes and point to a class of solutions involving nonlinear optical mixing.

N76-25537/1GA PC$3.50/MF$3.00
Kanner (Leo) Associates, Redwood City, Calif.
Rearranged Fabry-Perot Interferometer for the Long Wave Infrared Region.
S. A. Ignatenko, I. A. Maslov, V. A. Soglasnova, and C. B. Sholomitskiy. Jun 76, 15p NASA-TT-F-17057, PR-249
Contract NASW-2790
Tran-Transl. into English from Acad. Of Sci. Ussr, Inst. Of Space Res. (Moscow), PR-249, 1975 15 p.

Descriptors: *Fabry-Perot interferometers, *Infrared radiation, Bimetals, Gratings (Spectra), Photoelectric cells.
Identifiers: Translations, Far infrared radiation, Exosphere, Atmospheric transmissivity, Optical measuring instruments, USSR.

For abstract, see STAR 1416

PAT-APPL-274 541/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
Pulsed Laser System.
Patent Application,
J. A. Caffo. Filed 25 Jul 72, 7p AD-D002 613/8
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Pulsed lasers, *Laser modulators, Q switching, Mirrors, Optical pumping, Neodymium lasers, YAG lasers.
Identifiers: *Patent applications, Q switched lasers, Neodymium YAG lasers, PAT-CL-331-94.5.

In the patent application a standard cavity, Q switched laser is used to initiate and sustain submicrosecond pulses in a long laser. Short pulses from the standard cavity laser are directed onto the remote reflector of a long laser and are then reflected back through the lasing material of the long laser. Properly timed activation of the long laser lasing material causes amplification and oscillation of the pulses in the long laser cavity. Beam expanding telescopes are used to focus the laser pulses on the long laser's remote reflector. By way of a specific example, the generation of submicrosecond pulses in a long laser has been accomplished using neodymium doped yttrium aluminum garnet (Nd:YAG) as the lasing material operating at 1.06 micrometers. The long laser includes two Nd:YAG rods in series, a rear 99 percent reflector (retroreflector or flat mirror) and a remote retroreflector.

PAT-APPL-672 195/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
An Acousto-Optic Q-Switch.
Patent Application,
Marion L. Scott, and James L. Jernigan. Filed 31 Mar 75, 17p AD-D002 596/5
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Acoustooptics, *Q switching, Laser beams, Transfer functions.
Identifiers: *Q switched lasers, *Patent applications, Light diffraction, PAT-CL-331-94.5.

The patent application concerns a very fast optical shutter, or Q-switch, using an acousto-optic diffraction cell and associated optics such that a fast chirp wave in the cell diffracts the light so that it will be matched by the transfer function of the optics. This is used for laser beam Q switching.

PAT-APPL-678 517/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
Tapered Crystal for Laser Modulator.
Patent Application,
L. B. Allen. Filed 19 Apr 76, 11p AD-D002 624/5
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Laser modulators, *Crystals, Shape, Optical communications, Laser communications, Switching, Lithium compounds, Tantalates.
Identifiers: *Patent applications, PAT-CL-332-7.51, Optical modulators, Lithium tantalates.

The patent application discloses a tapered crystal for use in a laser modulator in a communication system which reduces switching voltage and driving power requirements. Alternately, the crystals are tapered for reduced crystal capacitance, thus decreasing the modulator rise time. In the example cited crystals use the Pockels effect in lithium tantalate to provide polarization modulation of input laser light.

PATENT-3 909 113 Not available NTIS
Department of the Navy Washington D C
Optical Coupler.
Patent,
Larry B. Stotts. Filed 1 May 74, patented 30 Sep 75, 9p AD-D002 631/0, PAT-APPL-465 962 Supersedes AD-D000 470.

This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Optical waveguides, *Waveguide couplers, *Liquid crystals, *Patents, Dichroism, Thin films, Light scattering, Electric fields, Alignment, Fiber optics, Signal processing, Data transmission systems.
Identifiers: Optical modulators, Cholesteric liquid crystals, PAT-CL-350-160.

The circular dichroism exhibited by cholesteric liquid materials is employed to couple light having selected determinable wavelength and circular polarization out of an optical path. Thin films of selected cholesteric liquid crystal materials are interposed in an optical path so that the circular dichroism of the liquid crystal materials causes scattering of light energy having a particular combination of wavelength and circular polarization which is characteristic of the properties of each such material. Light energy which is not within the affected wavelength and circular polarization combinations is transmitted along the optical path without significant attenuation. The scattered light is coupled out of the optical path where it may be suitably detected for signal information content.

PATENT-3 918 794 Not available NTIS
Department of the Navy Washington D C
Liquid Crystal Optical Switch Coupler.
Patent,
A. Fenner Milton. Filed 29 Nov 74, patented 11 Nov 75, 5p AD-D002 633/6, PAT-APPL-528 588
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Waveguide couplers, *Optical switching, *Optical waveguides, *Liquid crystals, *Patents, Fiber optics transmission lines, Multimode, Refractive index, Dielectric waveguides, Electric fields.
Identifiers: PAT-CL-350-96, Optical modulators.

The patent describes an optical switch to divert a portion of optical energy from a multimode transmission line. Two rod-like dielectric materials positioned adjacent each other sandwich a liquid crystal material between the two. Input and output fiber bundles are connected to each of the rods. By use of optically transparent electrodes the index of refraction of the liquid crystal is controlled to pass one polarization of light when the crystal index of refraction is the same as the two rod-like dielectric materials and no light transfers when the index of refraction is lower.

PATENT-3 923 377 Not available NTIS
Department of the Navy Washington D C
High Angle Optical Ray Seperator.
Patent,
A. Fenner Milton. Filed 29 Nov 74, patented 2 Dec 75, 5p AD-D002 639/3, PAT-APPL-528 516
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Fiber optics transmission lines, *Waveguide couplers, *Patents, Dielectric waveguides, Refractive index, Mirrors, Optical glass, Multimode, Optical filters, Power dividers.
Identifiers: Pyrex glass, PAT-CL-350-96.

This invention provides a connector for coupling two optical transmission lines together for transmitting optical radiation which makes an angle with the fiber axis up to a critical angle. The connector specifically couples optical radiation having an angle greater than the cirtical angle out of the transmission line for other uses. The main section of the coupler is provided with a special coating which has an index of refraction less than that of the main section. Thus, radiation up to the critical angle will be reflected and pass through the coupler. Radiation with a greater angle than critical will not be reflected by the coating and will pass into a tapered slab secured above the coating. The tapered surface will reflect the radiation to the end where it will pass out the end surface or be reflected by a mirror on the end surface.

PATENT-3 933 410 Not available NTIS
Department of the Navy Washington D C
Optical Connector with Single Scrambling Volume.
Patent,
A. Fenner Milton. Filed 29 Nov 74, patented 20 Jan 76, 4p AD-D002 649/2, PAT-APPL-528 537
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fiber optics transmission lines, *Waveguide couplers, Dielectric waveguides, Refractive index, Connectors.
Identifiers: PAT-CL-350-96.

An optical connector provides input-output coupling to an optical transmission line without interrupting completely the flow of optical radiation. An optically transparent dielectric block is inserted between portions of a fiber bundle transmission line. The block has one flat side along its length which is bonded to a second material having at least one flat side along its length cooperating with the flat side of the block. The input-output bundles are attached to the second material which has the same index of refraction as the first block.

PATENT-3 936 141 Not available NTIS
Department of the Navy Washington D C
Multiple Optical Connector.
Patent,
A. Fenner Milton. Filed 29 Nov 74, patented 3 Feb 76, 4p AD-D002 653/4, PAT-APPL-528 536
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fiber optics transmission lines, *Couplers, *Connectors, Multimode, Mirrors.
Identifiers: PAT-CL-350-96.

The patent describes a connector to provide multiple input-output couplings to a multimode optical transmission line without interrupting the radiation flow. A local scrambling cylinder is placed between a multiple input-output bundle and a bidirectional T-coupler. A mirrored surface covers an area of the rod leaving uncovered the core area of the bundle that leads to the T. Input light is reflected by the mirror evenly to provide an optical path between the inputs and the outputs without affecting transmission through the T.

PATENT-3 936 144 Not available NTIS
Department of the Navy Washington D C
Frequency Selective Optical Coupler.
Patent,
William M. Caton. Filed 12 Dec 74, patented 3 Feb 76, 7p AD-D002 654/2, PAT-APPL-532 261
Supersedes AD-D000 569.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Optical waveguides, *Waveguide couplers, *Fiber optics transmission lines, *Patents, Signal processing, Frequency, Integrated circuits.
Identifiers: PAT-CL-350-96.

Coextensive first and second optical waveguides are disposed with substantially uniform periodic variations in spatial separation including repetitive sections of close proximity which will permit optical coupling therebetween. The first optical waveguide has a different optical length (i.e., different light energy propagation characteristics) than the second optical waveguide. Due to the different effective optical lengths of the two waveguides between contiguous sections of close proximity where optical coupling may take place, light energy of a determinable frequency propagated along one of the waveguides is substantially all coupled into the other optical waveguide in the course of propagating along a determinable number of the repetitive sections; light energy of all other frequencies is effectively phase cancelled and thus inhibited from being coupled between the two optical waveguides.

PATENT-3 937 557 Not available NTIS
Department of the Navy Washington D C
Star Coupler for Single Mode Fiber Communication Systems.
Patent,
A. Fenner Milton. Filed 29 Nov 74, patented 10 Feb 76, 3p AD-D002 656/7, PAT-APPL-528 538
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Fiber optics transmission lines, *Couplers, *Patents, Optical communications, Optical lenses, Focusing.
Identifiers: PAT-CL-350-96.

An optical coupler system is described in which optical communications from separate centers are transmitted over separate lines of a single optical fiber to a coupler which combines the information and transmits the combined information over different single fibers to other communication centers. This invention makes use of a number of different Selfoc lenses with indefinite working distance to couple light from each of a different number of input fibers substantially evenly to a different number of output fibers. A large diameter Selfoc lens transfers incoming radiation to smaller diameter Selfoc lenses which focusses the radiation onto different single fiber transmission lines.

PATENT-3 937 560 Not available NTIS
Department of the Navy Washington D C
Single Fiber Access Coupler.
Patent,
A. Fenner Milton. Filed 29 Nov 74, patented 10 Feb 76, 4p AD-D002 657/5, PAT-APPL-528 539
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fiber optics, *Couplers, Data transmission systems, Optical lenses, Mirrors.
Identifiers: Optical couplers, PAT-CL-350-96.

This invention makes use of focusing lens in combination with a coupler region to expand and collimate the output from a single fiber so that optical radiation may be coupled from one fiber to another and coupled off to a separate line. A mirror or mirrors may be positioned at a

45 degree angle to the axis of the optical path to couple out a fraction of the radiation to other lines.

PATENT-3 937 561 Not available NTIS
Department of the Navy Washington D C
Liquid Crystal Optical Image Attenuator.
Patent,
Donald W. Peterson, and Werner G. Hueber.
Filed 2 Dec 74, patented 10 Feb 76, 5p AD-D002 658/3, PAT-APPL-526 746
Supersedes AD-D000 566.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Display systems, *Electrooptics, *Liquid crystals, Optical images, Attenuators, Optical lenses, Electrodes, Light scattering, Fiber optics, Image converters.
Identifiers: Liquid crystal display systems, Optical data processing, *Optical attenuators, PAT-CL-350-96.

The invention is an optical image attenuator with an attenuation range of over 100,000. An optical lens device focuses the image on a first liquid crystal layer which scatters the directed light only when an electrical potential is applied to the layer, by means of transparent electrodes, and in proportion to the strength of potential applied. A proportion of the scattered light is absorbed within a coherent optic fiber plate or layer, the thickness and the spacing of the individual fibers of which can be varied to vary the contrast and attenuation of the system. Several stages may be stacked in series to obtain sufficiently high attenuation.

PB-254 579-T/GA PC$3.50/MF$3.00
Environmental Protection Agency, Research Triangle Park, N.C. Translation Services Section.
Geophysics: Elementary Absorption of Light Passing Through Clouds,
Guglielmo Zanotelli. 1940, 15p EPA-TR-76-111
Trans. of mono. Geofisica: Assorbimento Elementare della Luce nel Passagio Attraverso alle Nubi, n.p., Jun-Jul 1940 p42-50.

Descriptors: *Light transmission, Atmospheric attenuation, Water vapor, Absorptivity, Optical properties, Translations, Italy.
Identifiers: *Atmospheric transmissivity.

In the theory of the propagation of light through clouds, developed by Mecke, Albrecht, and Gordov, the properties of the medium are represented by two coefficients which express the disposition of the element of a cloud, that is, a drop of water, to diffuse and absorb light, respectively. In the present work, it is demonstrated how the absorption coefficient can be expressed as a function of the physical characteristics of the water drop, determining theoretically for light however diffused and polarized which penetrates this water drop, the quantity which will be absorbed and dissipated.

20H. Particle Physics

AD-A027 762/6GA PC$4.00/MF$3.00
Princeton Univ N J Plasma Physics Lab
On the Nonlinear Classical Theory of Induced Compton Scattering by Relativistic Charges. I,
Shayne Johnston, and Russell M. Kulsrud. May 76, 42p PPL-AP-87, AFOSR-TR-76-0736
Contracts F44620-75-C-0037, W-7405-Eng-48

Descriptors: *Compton scattering, *Electromagnetic radiation, *Charged particles, *Particle trajectories, *Electrodynamics, Perturbation theory, Trapping(Charged particles), Resonant frequency, Interactions, Nonlinear systems, Quantum theory, Plasma oscillations, Hamiltonian functions.
Identifiers: *Beat trapping, Induced scattering, Relativistic charges.

Attention is focused on the resonant interaction between a single charge, treated relativistically, and two coherent electromagnetic waves. The simplicity of context is exploited to elucidate aspects of the nonlinear theory of induced Compton scattering. In this paper I, a well-defined problem of finite duration is studied, namely the induced scattering of plane radiation pulses of arbitrary shape. The factors which affect the net wave conversion from one pulse to the other by a nearly resonant charge are investigated analytically. (Author)

20I. Plasma Physics

AD-A027 199/9GA PC$3.50/MF$3.00
Hebrew Univ Jerusalem (Israel) Racah Inst of Physics
Vacuum Arc Neutron Generator.
Final rept.,
B. S. Fraenkel, J. L. Schwob, D. Shaltiel, and D. Froindlich. May 76, 20p AFWL-TR-75-264
Grant AF-AFOSR-2562-73

Descriptors: *Spark chambers, *Neutron beams, *Electric arcs, Sparks, Gas ionization, Nuclear fusion, Deuterium, Israel.

Giant vacuum sparks have been useful for obtaining highly ionized atoms and high temperatures. It has been attempted to introduce deuterium into the electrode material, in order to obtain fusion in the spark. Generally, however, the hot plasma point formed in vacuum sparks did not form here. The presence of deuterium seems to prevent evolution of the processes leading to high temperatures. In some cases, however, several thousand neutrons were observed on sparking.

AD-A027 549/5GA PC$3.50/MF$3.00
Joint Inst for Lab Astrophysics Boulder Colo
Growth of Thermal Constrictions in a Weakly Ionized Gas Discharge in Helium,
E. F. Jaeger, L. Oster, and A. V. Phelps. 22 Jan 75, 12p
Contracts DAHC04-72-C-0047, DAHC04-73-C-0029
Availability: Pub. in The Physics of Fluids, v19 n8 p819-830 Jun 76.

Descriptors: *Gas discharges, Helium, Electron density, Gas ionization, Heating, Gas flow, Radial flow, Radial velocity, Plasma medium, Constrictions, Electrical resistance, High pressure, Recombination reactions, Diffusion, Specific heat, Gas lasers, Pumping(Electronics), Reprints.
Identifiers: Ambipolar diffusion, Joule heating.

Neutral and charged particle densities, radial velocities, and temperatures are calculated as functions of time for cylindrical discharges in helium at pressures from 1 to 1000 Torr and a radius of 1 cm. Ionization, recombination, ambipolar diffusion, specific heat of the neutrals, and variation of gas pressure in space and time are included. Ionization of excited states, energy loss by radiation, and space charge sheaths are neglected. Under most conditions, increased ionization in regions of decreased gas density causes a constriction of the discharge which is accentuated at high pressures and high recombination rates. Greater circuit resistance stabilizes the discharge. At low pressures, the electron density profile expands. Initial steep gradients in electron density cause constrictions off axis. (Author)

AD-A027 663/6GA PC$3.50/MF$3.00
Cornell Univ Ithaca N Y
Duct Flow in Strong Magnetic Fields,
J. S. Walker, and G. S. S. Ludford. 1975, 8p
ARO-5329.56-M
Grants DA-ARO-D-31-124-71-G163, NSF-GK-37427
Availability: Pub. in Recent Advances in Engineering Science, v6 p329-335 1975.

Descriptors: *Magnetic fields, *Magnetohydrodynamics, *Ducts, *Fluid flow, Three dimensional, Reprints.
Identifiers: Velocity profiles.

It is generally supposed that an understanding of MHD duct flow is provided by fully developed flows, whose theory was completed some time ago. However, recent investigations of three-dimensional effects have changed the picture radically. A guide is given to its present state by explaining the variety of possible flows in terms of a few basic properties.

AD-A027 725/1GA PC$4.50/MF$3.00
Fairchild Republic Co Farmingdale N Y
Plasma Acceleration in Pulsed Ablative Arc Discharges.
Interim rept. 15 Mar 75-15 Mar 76,
Dominic J. Palumbo, and Martin Begun. 15 Mar 76, 53p AFOSR-TR-76-0738
Contract F44620-74-C-0055

Descriptors: *Plasma accelerators, *Magnetohydrodynamics, *Electric discharges, *Numerical integration, *Plasma oscillations, High speed photography, Ablation, Diagnosis(General), Experimental data, Plasma devices, Coupling(Interaction), Electric propulsion.
Identifiers: Microthrusters, *Plasma thrusters, *Pulsed ablative discharges, Plasma diagnostics.

This program was the second phase of an effort to describe and understand plasma acceleration processes in pulsed ablative plasma accelerators using a continuum MHD approach as the basis for analytic modeling. Concurrent with analytic modeling, an experimental diagnostic effort was also performed so that calculated results could be compared to the measured parameters for evaluation of the applicability and accuracy of the model. Diagnostic measurements performed included magnetic flux density using small coil probes, current distribution using a Rogowski coil, plasma front location and velocity using time of arrival probes, and high speed photography using a high speed framing camera. Data was recorded on a digital memory oscilloscope having appropriate frequency response. An unsteady two-dimensional model of the plasma motion including the dissipative effects of finite plasma conductivity, viscosity, and thermal conductance was postulated. The model included direct coupling of the external capacitor discharge circuit to the plasma via the time variant plasma resistance and inductance. A second order accurate two-step explicit numerical integration scheme was used to solve the resulting five simultaneous parabolic partial differential equations and a second order Runge-Kutta technique was simultaneously used to solve the two simultaneous second order ordinary differential equations for discharge current and potential. Results of the two dimensional diagnostic scan are presented in detail but the results of calculations are not included since various problems with the numerics did not enable performing sufficient analysis to verify or disprove the applicability of the proposed model.

AD-A027 749/1GA PC$3.50/MF$3.00
California Univ Berkeley Electronics Research Lab
Electron Cyclotron Resonance Heating in a Pulsed Mirror Experiment,
N. Convers Wyeth, A. J. Lichtenberg, and M. A. Lieberman. 30 Jul 74, 11p AFOSR-TR-76-0781

Grant AF-AFOSR-1754-69
Availability: Pub. in Jnl. of Plasma Physics, v17 p679-688 1975.

Descriptors: *Cyclotron resonance phenomena, Electron energy, Heating, Plasma medium, Lithium, Density, Microwaves, Magnetic mirrors, Magnetrons, Ionization, Electromagnetic pulses, Adiabatic conditions, Barriers, Experimental data, Computerized simulation, Reprints.
Identifiers: ELectron cyclotron resonance heating, ECRH(Electron cyclotron resonance heating), Plasma density, Contract ionization.

Using a plasma, generated by contact ionization, in a pulsed mirror device, a microwave pulse is used for electron cyclotron resonance heating (ECRH). The average electron energy was found by measuring the X-ray bremsstrahlung spectrum from the plasma after peak compression, and the energy obtained was measured as a function of applied electric field. The results show a saturation of heating in agreement with the theory of ECRH of Lieberman and Lichtenberg. Computer calculations of the average electron energy and the energy distribution were in good agreement with the experimental data. (Author)

20K. Solid Mechanics

AD-A027 308/6GA PC$3.50/MF$3.00
Stanford Univ Calif Dept of Applied Mechanics
Free Torsional Vibrations of an Elastic Cylinder with Laminated Periodic Structure,
R. K. Kaul, and G. Herrmann. 24 Nov 75, 18p
Contract N00014-76-C-0054, Grant AF-AFOSR-2669-74
Availability: Pub. in International Jnl. of Solids and Structures, v12 p449-466 1976.

Descriptors: *Vibration, *Torsion, Wave propagation, Linear differential equations, Laminates, Cylindrical bodies, Elastic properties, Density, Periodic variations, Shear properties, Reprints.
Identifiers: Floquet theorem, Torsional vibration.

The theory of torsional vibrations of a circular cylinder, with a periodic variation of elastic constants and density normal to the axis of the cylinder, is developed in terms of Floquent waves. Floquet waves are quasi-periodic waves, whose amplitude profile has the same periodicity as that of the material and repeats with the periodicity of the cell. Using Floquet's theory, the diapersion spectrum is obtained for time-harmonic waves propagating in a laminated cylinder with periodic structure. It is shown that the dispersion spectrum has a band structure, consisting of passing bands and stopping bands. Motion in the case of grazing incidence, and motion at the end of the zones is discussed. It is also shown that as the radius of the cylinder tends to infinity, the torsional waves in a circular cylinder degenerate to SH-waves in laminated plates. (Author)

AD-A027 392/0GA Not available NTIS
Naval Research Lab Washington D C Shock and Vibration Information Center
The Shock and Vibration Digest. Volume 8, Number 7, July 1976.
Jul 76, 97p
See also Volume 8, Number 6, AD-A025 904.
Availability: Paper copy available from Shock and Vibration Information Center, Naval Research Lab., Code 8404, Washington, D.C. 20375. Annual subscription $40.00.

Descriptors: *Shock, *Vibration, Reports, Mountings, Vibration isolators, Nuclear reactors, Acoustics, Structural properties, Vibrational spectra, Shock spectra, Abstracts.

Contents: Vibration Isolating Mountings for Sensitive Equipment - New Design Criteria; Variational Methods of Analysis; Flow-Induced Vibration of Nuclear Reactor System Components; Current news; Abstracts from the current literature--(Analysis and Design, Computer programs, Environments, Phenomenology, Experimentation, Components, Systems).

AD-A027 461/3GA PC$3.50/MF$3.00
Lehigh Univ Bethlehem Pa Center for the Application of Mathematics
The Flexural Bifurcation Condition for a Thin Plate under Thrust.
Technical rept.,
K. N. Sawyers , and R. S. Rivlin. Apr 76, 10p Rept no. CAM-100-24
Contract N00014-76-C-0235

Descriptors: *Plates, *Thrust, *Deformation, Elastic properties, Thinness, Numerical analysis.
Identifiers: *Bifurcation theory.

Previous results on the bifurcation condition for a thick elastic plate are specialized to the case where the aspect ratio (thickness/length) tends to zero. It is found that the bifurcation condition is independent of material constants up to terms of fourth order in the aspect ratio and depends on only one material constant up to terms of eighth order.

AD-A027 462/1GA PC$3.50/MF$3.00
Lehigh Univ Bethlehem Pa Center for the Application of Mathematics
On the Possible Values of the Strain Invariants for Isochoric Deformations.
Technical rept.,
Kenneth N. Sawyers. Jul 76, 21p Rept no. CAM-100-25
Contract N00014-76-C-0235

Descriptors: *Stress strain relations, *Deformation, Matrices(Mathematics), Elastic properties.
Identifiers: Eigenvalues.

A description is given of all possible values of the strain invariants (I sub 1) and (I sub 2) that may be attained in any experiment involving isochoric deformations. A graphical representation of the eigenvalues of the strain matrix is derived for any specified values of the invariants.

AD-A027 536/2GA PC$3.50/MF$3.00
Stanford Univ Calif Dept of Applied Mechanics
The Dynamic Response of an Elastic Half Space with an Overlying Acoustic Fluid.
B. E. Bennett, and G. Herrmann. Jan 75, 4p
Contract N00014-67-A-0112-0065, Grant AF-AFOSR-2669-74
Availability: Pub. in Jnl. of Applied Mechanics, v98 n1 p39-42 Mar 76.

Descriptors: *Wave propagation, Seismic waves, Acoustic waves, Solids, Interfaces, Dynamic response, Loads(Forces), Disks, Displacement, Equations of motion, Velocity, Integral transforms, Sound transmission, Reprints.
Identifiers: *Elastic half space, Interface waves, Stonely waves.

A class of dynamic problems involving a semi-infinite elastic solid with an overlying semi-infinite acoustic fluid, subjected at the plane interface to arbitrary normal loading is investigated. A method of solution is proposed which reduces the class of problems under study to that in which the fluid is absent. A specific example is presented for an expanding disk-shaped load including numerical results for the subseismic range.

AD-A027 706/1GA PC$5.50/MF$3.00
Massachusetts Univ Amherst Dept of Civil Engineering
Vibrations of Thin Elastic Shells--A New Approach.
Interim rept.,
M. J. A. O'Callaghan, W. A. Nash, and P. M. Quinlan. Aug 75, 111p AFOSR-TR-76-0731
Grant AF-AFOSR-2340-72
See also report dated Dec 73, AD-779 782.

Descriptors: *Elastic shells, *Vibration, Resonant frequency, Spheres, Shells(Structural forms), Dynamic response, Boundary value problems, Computer programming.
Identifiers: *Spherical shells, Clamped plates.

A previous investigation by one of the present authors extended the method of Edge-Functions to the determination of natural frequencies and associated mode shapes of free vibration of thin elastic plates with a variety of boundary conditions. The present investigation further extends this approach to the case of a shallow elastic spherical shell of n-sided polygonal plan-form. Natural frequencies and associated mode shapes together with boundary residuals (indicating how well the approximate solution has satisfied boundary conditions) are readily displayed by the computer program offered. Results obtained in the present work are shown to be in excellent agreement with existing values for specific boundary conditions treated. The present approach involves only modest computer efforts but offers the significant feature of rapid determination of how precisely the boundary conditions have been satisfied along each edge of the shell.

N76-25382/2GA Not available NTIS
Central Electricity Generating Board, Berkeley (England). Nuclear Labs.
Determination of the Threshold for Fatigue Crack Propagation Using a Novel Random Amplitude Growth Technique.
E. K. Priddle. Jun 75, 16p RD/B/N-3235

Descriptors: *Crack propagation, *Fatigue (Materials), High temperature fluids, Copper, Fracture mechanics, Stainless steels, Stress concentration.
Identifiers: Steel 316, Steel EN3A, Great Britain.

For abstract, see STAR 1416

N76-25590/0GA PC$4.50/MF$3.00
Martin Marietta Corp., Denver, Colo.
Expansion and Improvements of the FORMA System for Response and Load Analysis. Volume 1: Programming Manual.
R. L. Wohlen. May 76, 68p NASA-CR-144317, MCR-76-217-V-1
Contract NAS8-31376
Seri-7.

Descriptors: *Dynamic loads, *Dynamic response, *Dynamic structural analysis, Fortran, *Matrix methods, Computer programming, Computer techniques, Digital computers, Subroutine libraries (Computers).
Identifiers: *FORMA computer program.

For abstract, see STAR 1416

N76-25591/8GA PC$9.25/MF$3.00
Martin Marietta Corp., Denver, Colo.
Expansion and Improvement of the FORMA System for Response and Load Analysis. Volume 2A: Listings, Dense Forma Subroutines.
R. L. Wohlen. May 76, 269p NASA-CR-144318, MCR-76-217-V-2A
Contract NAS8-31376
Seri-7.

Descriptors: *Dynamic loads, *Dynamic response, *Dynamic structural analysis, Fortran, *Matrix methods, Computer programming, Computer techniques, Digital computers, Subroutine libraries (Computers).
Identifiers: *FORMA computer program.

For abstract, see STAR 1416

N76-25592/6GA PC$6.00/MF$3.00
Martin Marietta Corp., Denver, Colo.
Expansion and Improvement of the FORMA System for Response and Load Analysis. Volume 2B: Listings, Sparse Forma Subroutines.
R. L. Wohlen. May 76, 144p NASA-CR-144319, MCR-76-217-V-2B
Contract NAS8-31376
Seri-7.

Descriptors: *Dynamic loads, *Dynamic response, *Dynamic structural analysis, Fortran, *Matrix methods, Computer programming, Computer techniques, Digital computers, Subroutine libraries (Computers).
Identifiers: *FORMA computer program, Sparse matrices.

For abstract, see STAR 1416

N76-25593/4GA PC$5.50/MF$3.00
Martin Marietta Corp., Denver, Colo.
Expansion and Improvement of the FORMA System for Response and Load Analysis. Volume 2C: Listings, Finite Element Forma Subroutines.
R. L. Wohlen. May 76, 119p NASA-CR-144320, MCR-76-217-V-2C
Contract NAS8-31376
Seri-7.

Descriptors: *Dynamic loads, *Dynamic response, *Finite element method, Fortran, *Matrix methods, Computer programming, Computer techniques, Digital computers, Dynamic structural analysis, Subroutine libraries (Computers).
Identifiers: *FORMA computer program.

For abstract, see STAR 1416

N76-25594/2GA PC$9.25/MF$3.00
Martin Marietta Corp., Denver, Colo.
Expansion and Improvement of the FORMA System for Response and Load Analysis. Volume 3A: Explanations, Dense Forma Subroutines.
R. L. Wohlen. May 76, 282p NASA-CR-144321, MCR-76-217-V-3A
Contract NAS8-31376
Seri-7.

Descriptors: *Dynamic loads, *Dynamic response, *Dynamic structural analysis, Fortran, *Matrix methods, Computer programming, Computer techniques, Digital computers, Subroutine libraries (Computers).
Identifiers: *FORMA computer program.

For abstract, see STAR 1416

N76-25595/9GA PC$5.00/MF$3.00
Martin Marietta Corp., Denver, Colo.
Expansion and Improvement of the FORMA System for Response and Load Analysis. Volume 3B: Explanations, Sparse Forma Subroutines.
R. L. Wohlen. May 76, 88p NASA-CR-144322, MCR-76-217-V-3B
Contract NAS8-31376
Seri-7.

Descriptors: *Dynamic loads, *Dynamic response, *Dynamic structural analysis, Fortran, *Matrix methods, Computer programming, Computer techniques, Digital computers, Subroutine libraries (Computers).
Identifiers: *FORMA computer program.

For abstract, see STAR 1416

N76-25596/7GA PC$5.00/MF$3.00
Martin Marietta Corp., Denver, Colo.
Expansion and Improvement of the FORMA System for Response and Load Analysis. Volume 3C: Explanations, Finite Element Forma Subroutines.
R. L. Wohlen. May 76, 98p NASA-CR-144323, MCR-76-217-V-3C
Contract NAS8-31376
Seri-7.

Descriptors: *Dynamic loads, *Dynamic response, *Finite element method, Fortran, *Matrix methods, Computer programming, Computer techniques, Digital computers, Dynamic structural analysis, Subroutine libraries (Computers).
Identifiers: *FORMA computer program.

For abstract, see STAR 1416

20L. Solid-State Physics

AD-A027 157/7GA PC$3.50/MF$3.00
Royal Aircraft Establishment Farnborough (England)
Investigation of the Phenomenon of Selective Migration in Friction (Issledovanie Yavleniya Izbiratelnogo Perenosa pri Trenii),
I. V. Kragelskii. 10 Mar 76, 15p RAE-Library Trans-1884, DRIC-BR-52558
Trans. of Vestnik Akademii Nauk SSR (USSR) 1 p25-32 1975, by J. W. T. Palmer.

Descriptors: *Wear resistance, *Friction, *Lubricants, Sliding friction, Migration, Surface properties, Atoms, Tin, Zinc, Copper alloys, Electrostatic fields, Surfaces, Metals, Ions, Colloids, Glycerols, Oxides, Films, Translations.
Identifiers: USSR, Diffusion.

A review is given of the way in which selective migration reduces wear. The process involves a series of stages; selective diffusion of atoms from the surface of an alloy, e.g. Sn or Zn from copper alloys, weakening of the surface layer, the formation of an electrostatic field in which metal ions and colloidal particles migrate, and the formation of a surface film from these particles. Specific fluid lubricants, e.g. glycerine, play an important role by inhibiting the formation of oxide films and by providing a medium for particle migration. (Author)

AD-A027 187/4GA PC$4.00/MF$3.00
Air Force Materials Lab Wright-Patterson AFB Ohio
Molecular Spectroscopy by Inelastic Electron Tunneling.
Final rept. Oct 73-Oct 74,
Kenneth P. Roenker. Jun 76, 33p Rept no. AFML-TR-76-75
Presented at the Conference on Electrical Insulation and Dielectric Phenomena, 21-23 Oct 74, Downington, Pa.

Descriptors: *Molecular spectroscopy, *Tunneling(Electronics), *Surface analysis, Doping, Aluminum, Lead(Metal), Junctions, Dielectrics, Electrical insulation.
Identifiers: Aluminum oxides, *Electron tunneling.

This report examines the capabilities and limitations of the technique of inelastic electron tunneling (IET) as a molecular spectroscopic tool for surface studies. Following a brief review of the literature, an outline of the theory is given and the experimental technique discussed. The tunneling spectra of both clean and doped Al-Al oxide-Pb junctions are considered in detail. A comparison with existing surface analysis techniques concludes the report. (Author)

AD-A027 203/9GA PC$8.00/MF$3.00
Mcdonnell Douglas Research Labs St Louis Mo
Preparation and Characterization of HgCdSe Alloys.
Final rept. 20 May 74-31 Dec 75,
Charles R. Whitsett, James G. Broerman, Donald A. Nelson, and Christopher J. Summers. 31 Jan 76, 146p Rept no. MDC-Q0591
Contract N00014-74-C-0318

Descriptors: *Infrared detectors, Selenides, Crystal growth, Single crystals, Cadmium selenides, Mercury compounds, Photoconductivity, Electrical conductivity, Hall effect, Band theory of solids, Temperature.
Identifiers: Mercury selenides.

The objectives of this research were to prepare single crystals of various compositions of Hg(1-x)Cd(x)Se alloys and to evaluate the 77-296 K performance capability of these alloys as detectors of infrared radiation, 2.05 micrometer wavelength radiation in particular. The initial plan involved the following three tasks: (1) Prepare single-crystal Hg(1-x)Cd(x)Se alloys with x-values of 0.18, 0.26, and 0.38. Anneal the alloys in Hg-vapor, vacuum, and Se-vapor to obtain a wide range of extrinsic electron concentrations; (2) Measure the Hall coefficient and electrical conductivity of each annealed Hg(1-x)Cd(x)Se alloy over the temperature range of 4.2-296 K; (3) Measure the photoconductivity from 1 to 10 micrometer wavelength of each annealed alloy at 77, 195, and 296 K. Measure the photoconductive-response rise and decay times in the wavelength range of detector utilization of each alloy.

AD-A027 228/6GA PC$4.50/MF$3.00
Air Force Materials Lab Wright-Patterson AFB Ohio
Analysis of the Mossbauer Spectra of NdCo5.
Final rept Oct 74-Feb 75,
Eugene W. Skiuzacek. Apr 76, 61p Rept no. AFML-TR-75-162
Also available as Rept. no. GNE/PH/75-9.

Descriptors: *Neodymium alloys, *Cobalt alloys, *Mossbauer effect, *Permanent magnets, Spectroscopy, Iron, Isotopes, Doping, Crystal lattices, Anisotropy, Absorption spectra.
Identifiers: Isotopic labeling, Tracer studies.

Permanent magnet production with rare earth-transition element compounds is not a well defined science because microscopic processes in these materials are not understood well. A study was conducted to analyze the Mossbauer spectra of NdCo5 doped with 3% Fe57 to determine the nuclear environment at each nonequivalent crystal lattice site. Absorption spectra were obtained for absorber temperatures of 300, 265, 255, 245, 235, 230 and 77 K, but poor velocity information, faulty, temperature control, and vacuum pump vibrations caused uncertainties in the accuracy of the spectra-especially near zero velocity. Each spectrum was fit to a sum of lorentzian profiles using a least-squares-minimization fitting program. Although the complex spectra were not accurately decomposed into individual site contributions, it was concluded that Fe57 atoms may reside in four nonequivalent sites. Preliminary results also indicated that the two non-Co sites cause the temperature dependent changes in the spectra. (Author)

AD-A027 261/7GA PC$5.00/MF$3.00
Massachusetts Inst of Tech Lexington Lincoln Lab
Solid State Research, 1976:1.
Quarterly technical summary rept. 1 Nov 75-31 Jan 76,
Alan L. McWhorter. 15 Feb 76, 88p ESD-TR-76-39
Contract F19628-76-C-0002

Descriptors: *Solid state electronics, *Quantum electronics, *Microelectronics, Solid state physics, Photodiodes, Solid state lasers, Surface waves, Charge coupled devices, Laser materials, Fiber optics, Epitaxial growth, Optical pumping, Tuning devices, Gas lasers, Laser pumping, Crystal structure, Semiconductor lasers, IMPATT diodes.
Identifiers: Optical resonators, Acoustic surface waves.

This report covers in detail the solid state research work of the Solid State Division at Lincoln Laboratory for the period 1 November 1975 through 31 January 1976. The topics covered are Solid State Device Research, Quantum Electronics, Materials Research, Microelectronics, and Surface-Wave Technology.

AD-A027 263/3GA PC$4.00/MF$3.00
California Inst of Tech Pasadena Div of Engineering and Applied Science
On the Failure of Ellipticity of the Equations for Finite Elastostatic Plane Strain.
Technical rept.,
James K. Knowles, and Eli Sternberg. May 76, 33p Rept no. TR-34
Contract N00014-75-C-0196

Descriptors: *Strain(Mechanics), Deformation, Matrices(Mathematics), Inequalities, Partial differential equations, Mathematical models, Numerical analysis, Solids.
Identifiers: Elliptic functions, *Elastostatics.

In this paper the authors establish necessary and sufficient conditions, in terms of the local principal stretches, for ordinary and strong ellipticity of the equations governing finite plane equilibrium deformations of a compressible hyperelastic solid. The material under consideration is assumed to be homogeneous and isotropic, but its strain-energy density is otherwise unrestricted. The authors also determine the directions of the characteristic curves appropriate to plane elastostatic deformations that are accompanied by a failure of ellipticity.

AD-A027 296/3GA PC$4.00/MF$3.00
Lehigh Univ Bethlehem Pa Dept of Physics
Correlations of the 4.77 eV-4.28 eV Luminescence Band in Silicon Dioxide with the Oxygen Vacancy.
Final rept. 1 Jul 75-30 Jun 76,
Colin E. Jones, and David Embree. 15 Jul 76, 39p Rept no. Scientific-10
Contract N00014-67-A-0370-0009

Descriptors: *Metal oxide semiconductors, *Amorphous materials, *Radiation damage, Luminescence, Silicon dioxide, Oxygen, Quartz, Field effect transistors, Spin resonance, Gamma rays, Intensity, Water vapor, Carbon.
Identifiers: Cobalt 60, Optical absorption, Band theory of solids, Vacancies(Crystal defects).

A luminescence band observed at 4.77 eV (260 nm) in crystalline and at 4.28 eV (290 nm) in amorphous silicon dioxide has been found to correlate with optical and spin resonance measurements of oxygen vacancy concentrations in a series of irradiated samples. The 4.28 eV (290 nm) band has also been observed in the silicon dioxide layer of metal-oxide semiconductor (MOS) devices. The intensity of the bands can be increased by chemical reduction in carbon monoxide vapor or decreased by heating in oxygen or water vapor. The 4.28 eV (290 nm) luminescence intensity in the MOS samples also seems to be related to the trapped positive charge in the silicon dioxide. These facts all support a model for the liminescence center as being the oxygen vacancy. (Author)

AD-A027 318/5GA PC$3.50/MF$3.00
IBM Thomas J Watson Research Center Yorktown Heights N Y
Photoemission Valence-Band Densities of States for Si, Ge and GaAs using Synchrotron Radiation,
W. D. Gorbman, and D. E. Eastman. 10 Aug 72, 6p AFOSR-TR-76-0656
Contracts F44620-70-C-0089, F44620-70-C-0029
Availability: Pub. in Physical Review Letters, v29 n22 p1508-1512, 27 Nov 72.

Descriptors: *Valence bands, *Gallium arsenides, *Germanium, *Silicon, Photoelectric emission, Spectral energy distribution, Energy levels, Ultraviolet spectroscopy, Reprints.
Identifiers: Density of states, Band theory of solids, Semiconductors, Synchrotron radiation.

Experimental valence band Optical Densities of States for Si, Ge and GaAs were obtained from ultraviolet photoemission energy distribution curves at about 25eV of photon energy. The width of the upper two valence bands of Si and the positions of several energy band minima for the second and third valence bands of Ge and GaAs have been accurately determined. Comparing with theoretical calculations based on optical data, we find good agreement for Si and observe significant differences for Ge and GaAs. (Author)

AD-A027 336/7GA PC$3.50/MF$3.00
IBM Thomas J Watson Research Center Yorktown Heights N Y
Photoemission Energy Distributions for Au from 10 to 40 eV using Synchrotron Radiation,
D. E. Eastman, and W. D. Grobman. 29 Mar 72, 6p AFOSR-TR-76-0658
Contracts F44620-70-C-0089, F44620-70-C-0029
Availability: Pub. in Physical Review Letters, v28 n20 p1327-1330, 15 May 72.

Descriptors: *Photoelectric emission, Electron energy, High resolution, Reprints.
Identifiers: *Synchrotron radiation, *Gold, Band theory of solids.

High-resolution (typically 0.15 eV) electron energy distributions are reported for Au at closely spaced intervals of photon energy in the 10- to 40-eV range. The data show much d-band structure which continuously varies in energy position and amplitude as the photon energy is varied, thereby indicating conservation of crystal momentum over the entire measured range. An experimental density of states for Au has been determined from the data by averaging over all photon energies using a modified f-sum rule for photoemission. (Author)

AD-A027 337/5GA PC$3.50/MF$3.00
Illinois Univ At Urbana-Champaign
Valley-Orbit Raman Scattering from Bound and Delocalized Electrons in n-Si,
Kanti Jain, and M. V. Klein. 1976, 11p AFOSR-TR-76-0670
Contract F44620-75-C-0091, Grant NSF-GH-33757
Availability: Pub. in Light Scattering in Solids, P298-308 1976.

Descriptors: Raman spectra, *Light scattering, *Silicon, Energy levels, Doping, Insulation, Electron scattering, Reprints.
Identifiers: Band theory of solids, Semiconductors.

Valley-orbit Raman scattering was first observed in n-Si(P) by Wright and Mooradian, who showed that certain transitions within the ls valley-orbit split manifold are strongly Raman active. Colwell and Klein found that the three valley-orbit Raman lines due to nitrogen donors in insulating 6H SiC broadened into a continuun that starts at zero energy for heavily doped, metallic samples. (2) Recently, Doehler, Colwell, and Solin have systematically studied the changes in the VO spectrum of n-Ge(As) on both sides of the metal-insulator transition. A sum-rule for valley-orbit Raman scattering is proven valid for all donor concentrations in the insulating and impurity-band regimes.

AD-A027 340/9GA PC$3.50/MF$3.00
Polytechnic Inst of New York Farmingdale Dept of Electrical Engineering and Electrophysics
Surface-Wave Correlation and Time Scaling in a Structure of Bi12GeO20-Si-LiNbO3,
W. C. Wang, and K. S. Meng. 13 Jun 75, 4p AFOSR-TR-76-0711
Contract F44620-69-C-0047, Grant NSF-GK-42719
Availability: Pub. in Applied Physics Letters, v27 n7 p375-377, 1 Oct 75.

Descriptors: *Semiconductors, *Acoustic waves, *Surface waves, Nonlinear systems, Reprints.
Identifiers: *Acoustic surface wave devices, Bismuth germanates, Silicon, Lithium niobates.

Surface-acoustic-wave correlation of two signals has been performed by using space-charge nonlinearity in a layered structure of Bi12GeO20-Si-LiNbO3. The two surface waves are collinear and propagate in the same direction. The same structure has also been used in a different mode of operation to perform the functions of convolution and time scaling. (Author)

AD-A027 416/7GA PC$5.00/MF$3.00
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
Joint Services Electronics Program.
Annual progress rept. no. 89, 1 Jan-31 Dec 75. Apr 76, 91p
Contract N00014-75-C-0648

Descriptors: *Quantum electronics, *Solid state electronics, *Control theory, *Systems analysis, Antenna arrays, Coupling(Interaction), Nonlinear systems, Liquid crystals, Josephson junctions, Laser beams, Amorphous materials.
Identifiers: Nonlinear optics, Nematic liquid crystals, Smectic liquid crystals.

Contents: Quantum Electronics, Solid State Electronics, Systems Analysis and Control, Control and Optimization, Electromagnetic Radiation and Propagation, Coupled Antennas and Arrays, Antennas and Waves in and Over Dielectric Conducting, and Plasma Media.

AD-A027 438/1GA PC$3.50/MF$3.00
New York Univ N Y Dept of Physics
Cooperative Electronic Transitions--Structural Transformations.
Final rept. 1 Jun 73-31 May 76,
Samuel J. Williamson. 28 Jun 76, 9p ARO-11125.4-P
Grant DA-ARO-D-31-124-73-G158

Descriptors: *Superconductors, *Band theory of solids, High temperature, Transformations, Structural analysis, Instability, Electrical resistivity, Electrons, Life span, Single crystals, Vanadium silicides.
Identifiers: Electron transitions, Crystal defects.

Experimental and theoretical studies of the electronic properties and lattice instability of the A-15 crystal class of high temperature superconductors have been completed. Experimental investigation of the structural instability in V3Si single crystals, a prototype sample in this class, and accompanying theoretical formulation of the relevant electronic density of states N(E) has shown that the form of N(E) is very sensitive to electron lifetime. The addition of defects in the lattice causes important changes in N(E) and stabilizes the cubic phase lattice. A new band structure model has been developed for A-15 high temperature supercon-

ductors based on a group theoretical approach whose key features are in agreement with less accurate band structure calculations. Experiments demonstrate that the complications of spin-orbit coupling in the prototype A-15 compound V3Si can be neglected. Preliminary measurements of the thermal expansion in a number of crystals below 77K are complete, and the work is being extended to higher temperatures (approx 500K) to investigate the influence of a superlattice development first reported by Schmidt et al. at Bell Laboratories. Electrical resistivity studies reveal a common behavior for all technologically important A-15 materials, which we have interpreted as arising from interband electron-phonon scattering.

AD-A027 441/5GA PC$4.00/MF$3.00
Hughes Research Labs Malibu Calif
Solid Phase Epitaxial Growth.
Annual progress rept. 1 May 75-30 Apr 76,
C. L. Anderson, and J. A. Roth. Jun 76, 35p
Contract N00014-75-C-0957

Descriptors: *Epitaxial growth, Thin films, *Silicon, Palladium compounds, *Silicides, Contamination, Physical properties, Electrical properties, Ultrahigh vacuum, Interfaces.
Identifiers: Solid phase epitaxial growth, Palladium silicides, Amorphous materials.

The preliminary results of an investigation designed to determine the effects of process-related interfacial and bulk contamination upon the physical and electrical properties of Si films grown by solid phase epitaxy (SPE) are reported. For control purposes, uncontaminated Si films were grown and characterized, starting from thin-film crystal-Si/Pd/amorphous-Si structures fabricated in ultrahigh vacuum. Comparison of defects observed in these films with films grown in the presence of known contamination by other workers suggests that some intentional contamination may be necessary for growth of high quality layers by the SPE process.

AD-A027 443/1GA PC$4.00/MF$3.00
Lehigh Univ Bethlehem Pa Dept of Physics
Optical and EPR Studies of Irradiated Silicon Dioxide Materials.
Final progress rept. 1 Jul 75-30 Jun 76,
Colin E. Jones. 15 Jul 76, 40p
Contract N00014-67-A-0370-0009

Descriptors: *Radiation damage, *Silicon dioxide, Electronic equipment, Absorption spectra, Luminescence, Electron spin resonance, Neutron irradiation, Oxygen, Amorphous materials, Crystals, Metal oxide semiconductors, Quartz, Transient radiation effects, Gamma rays, Defects(Materials).
Identifiers: Amorphous semiconductors.

Optical absorption, luminescence, and electron spin resonance have been measured for crystalline and amorphous silicon dioxide materials. The luminescence data and its correlation with the optical absorption and spin resonance form basically new areas of research. For fast neutron irradiation the luminescence increases with irradiation, and a band tentatively identified with the oxygen vacancy correlates with the optical absorption and spin resonance for this defect. Above 10 to the 20th power neutrons/sq cm the luminescence, especially the oxygen vacancy luminescence, decreases, suggesting the formation of a large number of nonluminescent competing traps. Gamma irradiation has a much larger effect on amorphous silicon dioxide than on crystalline materials. The same effect seems to be present in gamma irradiated metal-oxide semiconductors up through 10 to the 7th power.

AD-A027 469/6GA PC$10.50/MF$3.00
Illinois Univ At Urbana-Champaign Materials Research Lab
Materials Sciences Research.
Annual technical rept. 1 Jul 75-30 Jun 76.
Jul 76, 359p
Grant NSF-DMR72-03026
Sponsored in part by Advanced Research Projects Agency, Arlington, Va., Energy Research and Development Administration, Washington, D.C., Office of Naval Research, Arlington, Va., Air Force Office of Scientific Research, Bolling AFB, D.C., and Army Research Office, Research Triangle Park, N.C. See also report dated Jul 75, AD-781 676.

Descriptors: *Materials, *Solid state physics, *Scientific research, Semiconductors, Cryogenics, Crystal lattices, Superconductors, Band theory of solids, Crystal growth, Metallography, Metals, Polymers, Phase transformations, Nuclear magnetic resonance, Catalysis, Defects(Materials), Radiation effects, Mechanical properties, Spectroscopy, Test methods.

The report contains summaries of research under the following broad headings: Degenerate quantum systems; Electron-lattice coupling; Disordered materials; Surfaces, interfaces, small particles and catalysis; Mechanical properties of materials; Semiconductor materials and devices; Publications.

AD-A027 475/3GA PC$3.50/MF$3.00
Northwestern Univ Evanston Ill
Electronically Driven Instabilities in Metals,
A. J. Freeman, H. W. Myron, J. Rath, and R. P. Gupta. 4 Mar 75, 17p AFOSR-TR-76-0651
Grant AF-AFOSR-2012-71
Availability: Pub. in International Jnl. of Quantum Chemistry, Symposium, n9 p535-550 1975.

Descriptors: *Electrical conductivity, *Conduction bands, Instability, Metals, *Quantum chemistry, Lattice dynamics, Phase transformations, Spin resonance, Electron density, Electron spin resonance, Charge density, Zirconium.
Identifiers: Spin density waves, Charge density waves, Body centered cubic lattices.

Electronically driven instabilities of the conduction electrons in metals are manifested as spin density waves, charge density waves accompanied by periodic lattice distortions, or in structural phase transformations and are thought to result from a divergence in X(g), the generalized static electronic susceptibility. Examples of these instabilities are discussed by means of accurate calculations of the noninteraction conduction electron susceptibility X(g) using results of energy-band calculations and our recently developed analytic tetrahedron linear energy method, notably, the occurrence of change density waves in the layered dichalcogenides and the body-centered cubic to omega phase transformation in metals like Zr. (Author)

AD-A027 476/1GA PC$3.50/MF$3.00
Northwestern Univ Evanston Ill
Large Electron-Phonon Interaction but Low-Temperature Superconductivity in LaB6,
A. J. Arko, G. Crabtree, J. B. Ketterson, F. M. Mueller, and P. F. Walch. 10 Mar 75, 11p AFOSR-TR-76-0652
Grant AF-AFOSR-2012-71
Availability: Pub. in International Jnl. of Quantum Chemistry, Symposium, n9 p569-578 1975.

Descriptors: *Superconductivity, Superconductors, Lanthanum compounds, Low temperature, Phonons, Electrons, Magnetic properties, Fermi surfaces, Borides, Wave functions, Interactions, Band theory of solids, Reprints.
Identifiers: Lanthanum, Borides, Transition temperture, Electron phonon interactions, Magnetic susceptibility.

Combined experimental and theoretical studies are reported on the Fermi surface, band structure, generalized magnetic susceptibility, electron-phonon enhancement factor (Gamma) and superconducting transition temperature T. of LaB6. Whereas the unusually large (Gamma) values, ranging from 1.0 to 2.5, are expected to result in high T values, T is observed to be only 0.122 K. These results further emphasize the need for appropriate theoretical formulations for these systems. (Author)

AD-A027 477/9GA PC$3.50/MF$3.00
Salford Univ (England) Dept of Pure and Applied Physics
The Microstructure of SmCo5 Sintered Magnet Materials,
A. Riley. 26 Apr 75, 13p AFOSR-TR-76-0640
Grant AF-AFOSR-2102-71
Availability: Pub. in Jnl. of the Less-Common Metals, 44 p307-317 1976.

Descriptors: *Samarium compounds, Samarium intermetallics, Cobalt, Electron microscopy, Powder alloys, Magnetic properties, *Permanent magnets, Microstructure, Reprints.
Identifiers: *Cobalt alloys, Cobalt intermetallics.

Using conventional (100 kV) and high (1 MV) voltage transmission electron microscopy, the microstructure of hyperstoichimetric SmCo5 magnet material has been examined. Second phase regions, investigated by electron-microscope microanalysis (EMMA), have been found to be either of composition close to Sm3Co or SmCo. Sm3Co is found both at grain boundaries and within the otherwise single-phase SmCo5 grains, whilst the SmCo regions are found only at grain boundaries. If the precipitation of Sm3Co near to grain boundaries in Sm-rich sinters is both typical of hyperstoichiometric magnets and a consequence of the ability of SmCo5 to exist over a range of compositions at elevated temperatures, then a new basis is provided for explaining some of the observed magnetic properties. (Author)

AD-A027 487/8GA PC$3.50/MF$3.00
California Univ Irvine Dept of Physics
Surface Optical Constant of Silicon and Germanium Derived from Electron-Energy-Loss Spectroscopy,
H. Froitzheim, H. Ibach, and D. L. Mills. 26 Nov 74, 11p TR-74-51, AFOSR-TR-76-0440
Grant AF-AFOSR-2018-71
Availability: Pub. in Physical Review B, v11 n12 p4980-4988, 15 Jun 75.

Descriptors: Electrons, Inelastic scattering, *Optical properties, *Surface properties, *Silicon, *Germanium, Spectroscopy, Reprints.
Identifiers: *Electron energy loss, Semiconductors, Electron transitions, Atomic energy levels, Atomic spectroscopy.

High-resolution electron-energy-loss spectra are reported for cleaved surfaces of silicon and germanium. The inelastic scattering has been observed with a small calibrated angular aperture spectrometer under various angles of incidence. Therefore absolute inelastic cross sections could be derived. For higher loss energies (> 3.5 eV), where bulk transitions prevail, the cross sections are in agreement with a recent theory of Mills that relates the cross sections to a loss function Im(-1/(epsilon + 1)) calculated from the bulk dielectric function epsilon(omega). For smaller energies additional surface-state transitions are observed. These cross sections are described by assuming an optically active surface layer. The optical absorption of this layer is calculated from the loss spectra in an energy range up to 3 eV through use of an extension of the earlier theory. The result compares reasonably well to previously reported optical data.

AD-A027 543/8GA PC$3.50/MF$3.00
California Univ San Diego La Jolla Inst for Pure and Applied Physical Sciences
The Effect of Crystal Field Splittings on the Electrical Resistivity of NdB6,
Z. Fisk. 24 Jul 75, 4p AFOSR-TR-76-0653
Contract F44620-72-C-0017
Availability: Pub. in Solid State Communications, v18 n2 p221-223 1976.

Descriptors: *Electrical resistivity, Borides, Temperature, Crystal structure, Theory, Reprints.
Identifiers: *Neodymium borides, Neodymium compounds.

The contricution to the electrical resistivity of NdB6 arising from temperature dependent crystal field level populations is experimentally measured and accounted for by theory. (Author)

AD-A027 565/1GA PC$3.50/MF$3.00
Stanford Univ Calif Dept of Materials Science and Engineering
Excess Capacitance and Non-Ideal Schottky Barriers on GaAs,
Prahalad K. Vasudev, Brenton L. Mattes, Edward Pietras, and Richard H. Bube. 11 Aug 75, 3p ARO-11744.1-EL
Contract DAAG29-74-C-0025
Availability: Pub. in Solid-State Electronics, v19 p557-559 1976.

Descriptors: *Schottky barrier devices, *Semiconductors, Capacitance, Gallium arsenides, Cadmium sulfides, Voltage, Reprints.

Non-ideal behavior in Schottky barriers on lightly doped and partially compensated semiconductors such as GaAs and CdS has been commonly observed (1-4). This behavior takes the form of (1) uncommonly large barrier heights in the forward-bias region, and (2) a non-linearity of curvature in the reverse-bias region of 1/sqC vs V plots.

AD-A027 609/7GA PC$3.50/MF$3.00
Carnegie-Mellon Univ Pittsburgh Pa Dept of Physics
Investigations in Solid State Physics: Magnetic Insulators at Low Temperatures.
Final rept. 1 Feb 70-31 Jan 76,
Simeon A. Friedberg. 20 Jul 76, 9p
Contracts N00014-67-A-0314-0006, N00014-75-C-0771

Descriptors: *Paramagnetism, Salts, *Transition metal compounds, Ferromagnetism, Ions, Low temperature, Phase studies, Ground state, Electron spin resonance.

A brief summary is given of the important results of a series of investigations of low temperature properties of certain transition metal salts which result from interactions of the paramagnetic ions. The materials studied include compounds with isolated spin clusters, linear chains of spins, 2 and 3 dimensional spin arrays, and singlet ground state systems. A detailed list of all technical reports and publications describing this work is given. (AUthor)

AD-A027 618/8GA PC$3.50/MF$3.00
Air Force Avionics Lab Wright-Patterson AFB Ohio
Excited States of Bound Exciton Complexes in InP,
D. C. Reynolds, C. W. Litton, R. J. Almassy, S. B. Nam, and P. J. Dean. 28 Jul 75, 6p Rept no. AFAL-TR-76-132
Availability: Pub. in Physical Review B, v13 n6 p2507-2510, 15 Mar 76.

Descriptors: *Excitons, Electron donors, Magnetic fields, *Indium phosphides, Gallium arsenides, Reprints.
Identifiers: Semiconductors, Excitation, Photoluminescence, Gas lasers, Krypton lasers.

The excited terminal states of bound-exciton-donor complexes have been studied in InP by photoluminescence using a krypton-ion laser (6741 A). A large number of optical transitions associated with the n = 2 and n = 3 excited donor states are observed for the first time in the magnetic field range from 12 to 40 kG. An accurate value of the binding energy of the donor (7.39 + or - 0.01) was determined in zero magnetic field. Using this value of the binding energy and the effective mass measured by cyclotron resonance, we obtained a value of 12.21 + or - 0.05 for the static dielectric constant. Neither adiabatic nor perturbation calculation schemes successfully describe these data, but a reasonably good fit is achieved using a phenomenological scheme developed earlier. (Author)

AD-A027 748/3GA PC$3.50/MF$3.00
Michigan State Univ East Lansing Dept of Physics and Astronomy
Lower-Dimensional Antiferromagnetism in Rb2NiCl4 x 2H2O,
H. Forstat, P. T. Bailey, J. R. Ricks, and J. N. McElearney. 3 Sep 75, 8p AFOSR-TR-76-0751
Grant AF-AFOSR-0430-67
Prepared in cooperation with Illinois Univ. at Chicago Circle. Dept. of Chemistry.
Availability: Pub. in Physical Review B, V13 n3 p1277-1283, 1 Feb 76.

Descriptors: *Antiferromagnetism, Rubidium compounds, Magnetic properties, Low temperature, Crystal structure, Chlorides, Nickel compounds, Hydrates, Reprints.
Identifiers: *Rubidium tetrachloronickelates, Nickelates/tetrachloro, Magnetic ordering.

The results of low-temperature studies of the magnetic characteristics of Rb2NiCl4 x 2H2O are reported. The studies generally indicate the presence of lower-dimensional antiferromagnetic exchange, with magnetic ordering occurring at T sub N = 4.65 K. Magnetic-susceptibility measurements from 1.5 to 30 K and heat-capacity data from 2 to 20 K have been analyzed using a model in which the compound is considered to consist of planes of interacting Heisenberg-like spin-1 linear chains. This model is shown to be consistent with the crystal structure in which hydrogen-bond pathways appear to be the major means of exchange between Ni(2+) ions. The important quantitative results are: the zero-field splitting is small, probably less than 0.5 K, the intrachain exchange is -2.32 K, and the interchain exchange is -0.82 K.

N76-26007/4GA Not available NTIS
Atomic Energy of Canada Ltd., Chalk River (Ontario).
Gradient Approximation for Calculating Debye Temperatures from Pairwise Interatomic Potentials.
D. P. Jackson. Sep 75, 12p AECL-5246

Descriptors: *Potential gradients, *Specific heat, *Temperature gradients, Cubic lattices, Mathematical models.
Identifiers: Canada, *Debye temperatures.

For abstract, see STAR 1416

20N. Wave Propagation

AD-A027 215/3GA PC$4.50/MF$3.00
Riverside Research Inst New York
Present Status of the RRI Slant-Path Absorption Model (SLAM) Computer Program.
Technical rept. 19 Mar 75-23 Jan 76,
D. Koppel. 23 Jan 76, 56p Rept no. RRI-T-2/306-3-14
Contract DAAH01-74-C-0419, ARPA Order-2281

Descriptors: *Electromagnetic wave propagation, *Radiation attenuation, *Atmosphere models, *Computer programs, Millimeter waves, Submillimeter waves, Far infrared radiation.
Identifiers: *Atmospheric attenuation, SLAM computer program.

A computer program (SLAM) is described which calculates the attenuation by air of microwave and submillimeter radiaton. Besides the horizontal attenuation, the vertical attenuation from various levels down to the ground and out into space is calculated for a fixed frequency. The line profile and atmospheric model can be selected from among several. Comparison is made with other calculations, and with experiments. Possibilities for improving the program are discussed. (Author)

AD-A027 218/7GA PC$3.50/MF$3.00
Mission Research Corp Santa Barbara Calif
Note on the Use of Charge Injection for SGEMP Simulation.
Topical rept. 1-31 Dec 74,
Conrad L. Longmire. Jul 75, 18p MRC-N-175, DNA-3656T
Contract DNA001-75-C-0125

Descriptors: *Electromagnetic pulse simulators, *Pulse generators, Self contained, Simulation, Radiation damage, Nuclear explosions, X rays, Artificial satellites.
Identifiers: Charge injection, SGEMP(System generated electromagnetic pulses), System generated electromagnetic pulses.

This note discusses techniques and rationale for using self-contained electrical pulsers for simulating system-generated electromagnetic pulse (SGEMP) generated by x rays striking satellites. (Author)

AD-A027 303/7GA PC$3.50/MF$3.00
Princeton Univ N J Dept of Electrical Engineering
Model for Radio Interference Produced by Corona Pulses on a. C. Lines,
James H. Gilchrist, and John B. Thomas. 13 Feb 75, 7p ARO-7624.55-EL
Contract DAHC04-69-c-0012, Grant NSF-gk-24187
Availability: Pub. in Proceedings of the IEE, v122 n11 p1260-1264 Nov 75.

Descriptors: *Radio interference, *Transmission lines, *Electrical corona, Alternating current, Voltage, Reprints.
Identifiers: Spectral density.

A model is proposed for radio interference produced by pulsed corona on a.c. lines. This model uses pulse shapes which agree with experimental observations, and it incorporates the timing information forced on the corona by a sinusoidally varying voltage. For applied voltages ranging from the onset voltage to a level just below the spark voltage, predictions are given of the mean corona current and the spectral density. The effect of the alternating line voltage on the spectral density is indicated through an example. (Author)

E76-10412 PC$4.00/MF$3.00
Kansas Univ./Center for Research, Inc., Lawrence. Remote Sensing Lab.
Methods for Correcting Microwave Scattering and Emission Measurements for Atmospheric Effects.
Technical Memo.,
Mark Komen. Aug 75, 32p CRES-TM-254-6, NASA-CR-147781
Contract NAS9-13642

Descriptors: Clouds(Meteorology), Salinity, Water temperature, *Atmospheric attenuation, Algorithms, Brightness temperature, EREP, Skylab program, Microwave radiometers.

Identifiers: *Microwaves, *Atmospheric scattering.

The author has identified the following significant results. Algorithms were developed to permit correction of scattering coefficient and brightness temperature for the Skylab S193 Radscat for the effects of cloud attenuation. These algorithms depend upon a measurement of the vertically polarized excess brightness temperature at 50 deg incidence angle. This excess temperature is converted to an equivalent 50 deg attenuation, which may then be used to estimate the horizontally polarized excess brightness temperature and reduced scattering coefficient at 50 deg. For angles other than 50 deg, the correction also requires use of the variation of emissivity with salinity and water temperature.

21. PROPULSION AND FUELS

21B. Combustion and Ignition

AD-A027 411/8GA PC$3.50/MF$3.00
Naval Research Lab Washington D C
Ignition of Flammable Gases in Crude-Oil Tankers as a Result of Metal Fracture.
Final rept.
W. A. Affens, and E. A. Lange . 29 Jun 76, 15p
Rept no. NRL-8013

Descriptors: *Flammability, *Oil tanks, *Fracture(Mechanics), Metals, *Tankers, Gases, *Ignition, Sparks, Literature surveys, High temperature, Vapors, Friction, Pyrophoric materials, Compression, Adiabatic conditions, Energy, Static electricity, Crack propagation.
Identifiers: Accidents.

A literature search and an energy analysis have shown that the energies generated and the temperatures developed by metal fracture are not sufficient to ignite a flammable mixture of hydrocarbon vapor and air directly. It was concluded from this study that if metal fracture were to be a cause of ignition, it would be by an indirect process. The most likely cause of ignition resulting from metal fracture would be due to frictional impact or friction of fractured metal structural members with each other or with other objects. It was also concluded that normal impact (without friction) or single rubbings would not generate sufficient energy for ignition unless friction sparks also resulted. Friction sparks are more likely to cause ignition if highly pyrophoric metals are present. It was also concluded that adiabatic compression is a possible source of ignition in the case of ship collisions. (Author)

AD-A027 439/9GA PC$4.00/MF$3.00
Cornell Univ Ithaca N Y Dept of Theoretical and Applied Mechanics
Mathematical Theory of Laminar Combustion III. The Flame of a Linear Condensate.
Technical rept.,
Geoffrey S. S. Ludford. Jun 76, 35p TR-82, ARO-12373.22-M
Grant DAAG29-76-G-0026

Descriptors: *Combustion, Laminar flow, Theory, One dimensional flow, Flames, Activation energy, Asymptotic series, Mathematical analysis, Pyrolysis, Heat loss, Heat exchangers, Condensation reactions, Linear systems.
Identifiers: Laminar combustion.

The present series of Technical Reports (of which nos. 77 and 80 were the first two) will give a connected account of laminar combustion from the viewpoint of activation energy asymptotics. The present report is concerned with the simplest, realistic one-dimensional problem of combustion: To determine the conditions under which there is a steady flame when the reactants are produced at the surface of a solid or liquid. In contrast to earlier treatments, these conditions are clearly uncovered by the asymptotic analysis, which leads to several unsuspected phenomena. Account is taken of radiative exchange between the surface and its surroundings as well as distributed heat loss. (Author)

AD-A027 690/7GA PC$4.00/MF$3.00
Southwest Research Inst San Antonio Tex Army Fuels and Lubricants Research Lab
Development of Engine and Lubricant Interferant Substances.
Rept. for May 75-May 76,
E. A. Frame, A. A. Johnston, E. J. Baker, and J. K. Dean. May 76, 47p Rept no. AFLRL-79
Contract DAAG53-75-C-0185

Descriptors: *Chemical agents, *Compression ignition engines, *Spark ignition engines, *Foam, Interference, Internal combustion engines, Performance, Degradation, Ignition, Combustion, Lubrication, Surface active substances, Propane, Tetrafluoroethylene resins, Gases, Liquids.
Identifiers: Hi-Ex foam.

A variety of chemicals were evaluated as potential combustion modifiers and/or lubricant degradants in spark and compression ignition engines. Several materials showed good to excellent potential for combustion/ignition interference. None of the materials tested produced dramatic short-term lubricant interference. High expansion ratio water based foam was investigated as a medium for dispensing engine interferent chemicals. Propane was found to be compatible with the water based foam and this system was used for a feasibility demonstration which showed engine interference and the dispensing of an interferent. (Author)

PATENT-3 926 562 Not available NTIS
Department of the Navy Washington D C
Vertical Tube Combustion Reactor.
Patent,
Frederick W. Williams, and Ronald S. Sheinson. Filed 23 Aug 74, patented 16 Dec 75, 5p AD-D002 641/9, PAT-APPL-500 208
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Combustion products, *Laboratory equipment, Chemical reactors, Performance tests.
Identifiers: PAT-CL-23-253, Design criteria.

A vertical tube reactor for analyzing combustion in which the controllable electrically heated reactor tube with optional opposing side ports is sealed to an outer transparent jacket having ports optically aligned therewith, has an optionally heated chimney, and has a lower port suitable for introducing reactants, sensors, and dopants therein.

21C. Electric Propulsion

N76-25343/4GA PC$6.00/MF$3.00
TRW, Inc., Redondo Beach, Calif.
Beam Efflux Measurements.
Final Report.
G. K. Komatsu, and J. M. Stellen, Jr.. 1 Jun 76, 137p NASA-CR-135038
Contract NAS3-19537

Descriptors: *Efflux, *Ion propulsion, Computerized simulation, Electrostatic propulsion, Ion beams, Ion currents, Ion engines.

For abstract, see STAR 1416

21D. Fuels

PB-254 969/9GA PC$8.00/MF$3.00
Federal Energy Administration, Washington, D.C.
National Petroleum Product Supply and Demand, 1976-1978,
Christopher B. Alt. May 76, 249p* FEA/B-76/281

Descriptors: *Petroleum products, Energy demand, Demand(Economics), Supply(Economics), Energy supplies, Crude oil, Kerosene, Jet engine fuel, Propane, Residual oils, Distillates, Gasoline, Econometrics, Economic models, Energy models, Imports, Prices, Computerized simulation, Forecasting.
Identifiers: *Energy forecasts, Feedstocks.

This report presents a documentation of the short-term petroleum product supply and demand forecasting methodology used at the Federal Energy Administration. Four petroleum product supply and demand forecasts are presented for the period 1976 through 1978. The four forecasts consist of a base case and three alternative cases: (1) composite low demand, (2) composite high demand, and (3) low domestic supply. The four cases differ with respect to the following: (1) projections of economic growth, (2) impact of natural gas curtailments on petroleum demand, (3) normal or abnormal weather, (4) implementation of the Energy Policy and Conservation Act of 1975 (EPCA), (5) estimates of conservation savings, and (6) projections of domestic crude oil production.

PB-255 117/4GA PC$4.50/MF$3.00
Stanford Research Inst., Arlington, Va.
Meeting Report: Advanced Fossil Fuels Sector Group, Cincinnati, 31 March 1976.
Jun 76, 75p EPA/600/7-76-001
Contract EPA-68-01-1981

Descriptors: *Fossil fuels, *Meetings, Shale oil, Coal, Synthetic fuels, Environmental impacts, Pollution, Oil shale.

The general areas of concern were: (1) A review of the content of the second Sector Group Meeting with indications of action taken; and (2) The development of oil shale processing, in which the following areas were addressed--(a) Health effects and environmental assessment programs at EPA, ERDA, and DoD; (b) Environmental measurements and technology programs at EPA, ERDA, and DoD; and (c) Industrial point of view.

PB-255 176/0GA PC$12.00/MF$3.00
Bureau of Mines, Washington, D.C.
Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts East of the Mississippi.
Information circular,
Lulie H. Crump. May 76, 462p* BuMines-IC-8704
See also PB-255 177.

Descriptors: *Fuel consumption, *Energy consumption, Petroleum products, Fossil fuels, Natural gas, Coal, Petroleum, Electric power, Hydroelectric power, Nuclear power, Gasoline, Jet engine fuels, Kerosene, Distillates, Residual oils, Liquefied petroleum gases, Asphalts, Transportation, Commerce, Households, Industries, United States, Tables(Data).
Identifiers: *Eastern Region(United States), *Electric power consumption, Residential sector, Commercial sector, Industrial sector, Transportation sector.

Salient historical data on consumption of fuels and energy are summarized by state and census district for the years 1960 through 1972 for states east of the Mississippi. Data are given for the residential, commercial, industrial, and transportation sectors.

PB-255 177/8GA PC$11.75/MF$3.00
Bureau of Mines, Washington, D.C.
Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi.
Information circular,
Lulie H. Crump. May 76, 431p* BuMines-IC-8705
See also PB-255 176.

Descriptors: *Fuel consumption, *Energy consumption, Petroleum products, Fossil fuels, Natural gas, Coal, Petroleum, Electric power, Hydroelectric power, Nuclear power, Gasoline, Jet engine fuels, Kerosene, Distillates, Residual oils, Liquefied petroleum gases, Asphalts, Tables(Data), Transportation, Commerce, Households, Industries, United States.
Identifiers: *Electric power consumption, *Western Region(United States), Residential sector, Commercial sector, Industrial sector, Transportation sector.

Selient historical data on consumption of fuels and energy are summarized by state and census district for the years 1960 through 1972 for states west of the Mississippi. Data are given for the residential, industrial, commercial, and transportation sectors.

21E. Jet and Gas Turbine Engines

AD-A027 243/5GA PC$4.50/MF$3.00
Rockwell International Canoga Park Calif Rocketdyne Div
High Power Study-Turbine Drive Systems. Volume II. Experimental Program.
Final rept. 2 Jun 75-1 Mar 76,
L. L. Tignac. May 76, 62p R-9889, AFAPL-TR-76-10-Vol-2
Contract F33615-75-C-2072

Descriptors: *Gas generating systems, *Bipropellants, Turbogenerators, High power, Airborne, Power supplies, Gas turbines, Drives, Liquid oxygen, Jet engine fuels, Hydrazine, Fuel injectors.
Identifiers: JP-4 Fuel, *Staged combustion gas generators.

The final report describes the results of experimental programs to study propellant combinations for high-power airborne power units. The LOX/JP-4 experimental program was conducted to assess the effect of pulsing duty cycles on carbon formation and breakup. The NTO/mixed hydrazine experimental program was conducted to assess the staged combustion gas generator concept using a bipropellant pilot injector. (Author)

AD-A027 413/4GA PC$4.50/MF$3.00
Sperry Vickers Troy Mich Vickers Aom Div
High Speed Hydraulic Starter Motor for Aircraft Auxiliary Power Unit.
Final technical rept. 8 Jan 73-1 Nov 75,
Harry T. Johnson, and Nicholas F. Pedersen. Mar 76, 74p 9-5011-100, AFAPL-TR-76-23
Contract F33615-73-C-2003

Descriptors: *Actuators, *Motor starters, *Auxiliary power plants, *Aircraft engines, Hydraulic equipment, Hydraulic fluids, Performance(Engineering), High velocity, Torque, Efficiency, Lubrication, Guide vanes, Gas turbines.
Identifiers: *Starter motors, *Vane motors.

The purpose of this research program was to develop a vane type hydraulic starter motor for aircraft, high-speed, auxiliary power units. The goals were to achieve a starter cutoff speed of 50,000 RPM and an inlet pressure capability of 8000 PSIG maximum using MIL-H-5606 hydraulic oil as the working fluid. A balanced, three element, single eccentric vane motor has been designed and proved capable of operation at 30,000 RPM and 3000 PSIG. The 0.145 cu in./rev. prototype motor had a 72% torque efficiency at the noted conditions. Although the design goals proved unattainable, the unique vane motor design demonstrated that high speed hydraulic motor operation is feasible. The inability of the vane tip/cam ring interface to survive the high vane tip surface speed and loading represents the major problem that must be eliminated if the goal conditions are to be achieved. Use of highly wear resistant vane and cam ring materials did not provide a solution to this difficult lubrication problem. The vane motor was not evaluated at the projected thermal extremes (-65 F. to +130 F.) and the proposed hydraulic starter system demonstration was not conducted when the operational limits were found to be far less than the original starter motor objectives. (Author)

AD-A027 414/2GA PC$5.50/MF$3.00
Rockwell International Canoga Park Calif Rocketdyne Div
High Power Study-Turbine Drive Systems. Volume I. Analytical Program.
Final rept. 2 Jun 75-1 Mar 76,
R. L. Binsley. May 76, 113p R-9889-Vol-1, AFAPL-TR-76-10-Vol-1
Contract F33615-75-C-2072
See also Volume 2, AD-A027 243.

Descriptors: *Gas generating systems, *Power supplies, *Turbogenerators, *Bipropellants, *Monopropellants, Turbojet engines, Airborne, Gas turbines, Drives, Systems engineering, Hydrogen peroxide, Liquid oxygen, Jet engine fuels, Hydrazine, Hydrazine derivatives, Computer programs, Algorithms, Mathematical models.
Identifiers: Hydraulic drives, Idling, Fast start.

This final report describes the results of a study of turbine drive systems for high power (10 to 50 MW) airborne power units. Propellant selection, system type selection, and turbine selection are analyzed. A computer program to calculate weight and volume of selected systems is described. Results of parametric analyses and specific point designs are presented. (Author)

AD-A027 518/0GA PC$6.75/MF$3.00
Pennsylvania State Univ University Park Applied Research Lab
Experimental and Analytical Investigation of Three-Dimensional Inviscid Effects in Turbomachinery.
Master's thesis,
Robert W. Howells, Jr. 22 May 74, 159p Rept no. TM-74-161
Contract N00017-73-C-1418

Descriptors: *Turbomachinery, *Three dimensional flow, Lifting surfaces, Cascades(Fluid dynamics), Rotor blades(Turbomachinery), Static pressure, Dihedral angle, Numerical analysis, Theses.

A relatively simple, rapid method for predicting the three-dimensional flow effects in turbomachinery of arbitrary configuration was investigated. Although the two-dimensional cascade is a satisfactory approximation for the design and analysis of some types of turbomachines, the flow through devices such as propeller pumps, inducers, and fans for turbofan engines may deviate significantly. No solution exists for the complete, unified three-dimensional flow problem, but analyses which include the effect of three-dimensional flows have been developed. These typically involve lengthy numerical solutions for specialized cases and are not optimum for design nor for a unified study of three-dimensional flow trends.

AD-A027 674/1GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Contracting for the Component Improvement Program (CIP) for Military Aircraft Engines.
Student project rept.,
John D. Geron. May 75, 59p

Descriptors: *Contract administration, *Engine components, Life expectancy, Optimization, Jet engines, Aircraft engines, Reliability, Maintainability, Standards, Air Force procurement, Costs, Systems analysis, Aircraft maintenance, Repair, Maintenance management, Contracts, Military requirements, Life cycle costs, Military aircraft, Acquisition.
Identifiers: Program management, Component improvement program, Cost plus fixed fee contracts.

This study was scoped to look at the CIP for military aircraft engines. With an eye toward where it has been in the past, various agencies have looked at CIP to determine how it can be done better. These studies were looked at and analyzed, and the question baseline was pinpointed to the contracting function. The need to conserve dollars is a driving function, but the engine need to perform for longer periods in longer time between overhaul is equally important. At issue also is how the Government can better control the contract's effort through a higher degree of visibility to management in both engineering and funding.

AD-A027 699/8GA PC$5.00/MF$3.00
Rockwell International Canoga Park Calif Rocketdyne Div
Chemical Engine/Gear System Program.
Final rept. 1 Jul 75-7 May 76,
D. Hodson, and W. Studhalter. 30 May 76, 100p
Rept no. R-9909
Contract DAAG53-75-C-0250

Descriptors: Power supplies, *Gas generating systems, Engines, Gas turbines, Gearboxes, Pumps, Models, Bipropellants, Monopropellants, Liquid oxygen, Hydrogen peroxide, Nitrogen oxides, Tetroxides, Hydrazine, Methyl hydrazines, Jet engine fuels, Horsepower, Mobile, Cost effectiveness, Exhaust gases.

A two-phase program was conducted to define a liquid-fueled chemical engine/gear (CEG) system for use as part of a mobile power supply. In the first phase, engineering design studies were accomplished wherein several propellants were considered and appropriate system configurations and operating characteristics were defined for each case. Each alternative system was optimized and tradeoff comparisons were made leading to conceptual definition of the best approach for the target CEG system. In the second phase, design characteristics were formulated for the selected CEG system and design drawings for the assembly and its major elements were generated. Subsequently, a general development plan was prepared to describe fabrication and test evaluation of a pilot model CEG system. (Author)

AD-A027 718/6GA PC$4.00/MF$3.00
Kentucky Univ Lexington Dept of Engineering Mechanics
Thermo-mechanical Stress Analysis of Advanced Turbine Blade Cooling Configuration.
Interim rept. 1 May 75-30 Apr 76,
F. J. Rizzo, and D. J. Shippy. May 76, 49p UKY-TR95-76-EM12, AFOSR-TR-76-0841
Grant AF-AFOSR-2824-75

Descriptors: *Gas turbine blades, *Film cooling, Transpiration, Thermal stresses, Stress concentration, Stress analysis.
Identifiers: Thermoelasticity.

A thermo-mechanical stress analysis capability, based on the Boundary Integral Equation Method (BIE) is developed and described. The method of numerical implementation involves second order surface element discretization

with second order variation of key variables over the elements. The capability is varified or a number of test problems in preparation for application to a thermo-mechanical stress analysis problem for a transpiration cooled turbine blade.

AD-B023 358/3GA PC$4.00/MF$3.00
Air Force AERO Propulsion Lab Wright-Patterson AFB Ohio
Effects of Fuel Additives on the Performance of Filter-Separators.
Final rept. Jul 69-Jun 72,
Paul C. Linder. Aug 74, 44p Rept no. AFAPL-TR-73-97
Distribution limitation now removed.

Descriptors: (*Fuel additives, *Separators), (*Jet engine fuels, *Fuel filters), (*Corrosion inhibition, Separators), Fuel contamination, Impurities, Membranes, Water, Canisters, Ice, Deicing materials, Particulates, Test methods, Test equipment, Filtration, Aircraft engines, Jet engines, Aviation fuels, Iron oxides.
Identifiers: Filter coalescers, Filter separators, JP-4 fuel, Ice inhibitors, JP-5 fuel.

The effects of fuel corrosion inhibitors on the coalescencing performance of filter-separators were evaluated using a small 1.3 gpm test loop. These tests showed that corrosion inhibitors presently qualified to MIL-I-25017 differed significantly in their deleterious effects on coalescence when tested using Wright-Patterson AFB tap water as the free water contaminant. Single element tests using DOD standard filter-coalescer elements and a 20 gpm test loop showed: (1) filtration performance is affected by the type of solid contaminant used, the type and quantity of corrosion inhibitor, and the brand of filter-coalescer element used; and (2) coalescence performance can be significantly affected by the purity of free water (i.e. dissolved solids) when the fuel contains a corrosion inhibitor and fuel system icing inhibitor. (Author)

N76-25167/7GA PC$5.00/MF$3.00
Pratt and Whitney Aircraft, West Palm Beach, Fla. Government Products Div.
Effect of Swirling Flow on Augmentor Performance, Phase 2.
Final Report, Dec. 1974 - Dec. 1975.
T. R. Clements. Jun 76, 80p NASA-CR-135024, FR-7436
Contract NAS3-19413

Descriptors: *Propulsion system performance, *Swirling, *Thrust augmentation, Combustion efficiency, Flame propagation, Jp-5 jet fuel, Kerosene, Performance tests, Spraying, Turbojet engines.

For abstract, see STAR 1416

PAT-APPL-676 322/GA PC$3.50/MF$3.00
Department of the Air Force Washington D C
Engine Mounting Tension Tie System.
Patent Application,
William H. Cook. Filed 19 Apr 76, 11p AD-D002 619/5
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Turbofan engines, *Mounting brackets, Bending moments, Bleed systems, Installation, Wings.
Identifiers: *Patent applications, PAT-CL-244-54.

The patent application relates to a system for adapting an under-wing mounted jet engine for over-wing mounting by adding four tension members, two on each side, to the mounting installation at a location below the thrust line. The tension in these members replaces in part the fan duct blow-off loading and their location below the thrust line introduces bending moments which counter those causing the engine to deflect. Bleed air which varies with the engine thrust is used to energize the tension tie members in the form of pneumatic springs to allow for thermal and other strains and to accommodate engine thrust variations.

21H. Rocket Motors and Engines

AD-A027 375/5GA PC$3.50/MF$3.00
Army Missile Research Development and Engineering Lab Redstone Arsenal Ala Propulsion Directorate
Temperature Response of an Infinitely Thick Slab to Random Surface Temperatures.
Technical rept.,
Robert A. Heller. 6 May 76, 22p Rept no. RK-76-13

Descriptors: *Beams(Structural), *Solid propellant rocket engines, *Solid rocket propellants, Frequency response, Standard deviation, Power spectra, Density, Temperature coefficients, Response surface analysis, Seasonal variations, Diurnal variations.

Random process theory has been used to develop statistical relations for the temperature response in an infinitely thick slab when subjected to randomly varying surface temperatures. A realistic seasonal/diurnal temperature cycle with superimposed random hourly variations is used to represent the surface boundary condition. Frequency response, power spectral density, and standard deviation functions are determined as a function of slab depth for various times. For solid propellant material, the temperature drop is very rapid for the diurnal component but is only slightly attenauted for the seasonal cycle. (Author)

AD-A027 388/8GA PC$4.00/MF$3.00
Arnold Engineering Development Center Arnold Air Force Station Tenn
Evaluation of Reynolds Number and Tunnel Wall Porosity Effects on Nozzle Afterbody Drag at Transonic Mach Numbers.
Final rept. 29 Jan-10 Oct 74,
C. E. Robinson. Jul 76, 40p Rept no. AEDC-TR-76-70
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn. Rept. no. ARO-PWT-TR-75-157.

Descriptors: *Nozzles, *Transonic characteristics, *Wind tunnel tests, Afterbodies, Drag, Walls, Porous materials, Reynolds number, Model tests, Test methods, Test facilities, Jet engines.
Identifiers: Porous walls, Nozzle afterbodies.

An experimental investigation was conducted to study the effects of Reynolds number variation on isolated nozzle afterbody performance. A strut-mounted cone-cylinder model with three separate afterbody configurations for Aerospace Research and Development (AGARD) was used for this investigation. This program was conducted in two phases distinguished by the model size and the wind tunnels used to obtain the experimental results. The effect of tunnel wall porosity on nozzle afterbody (NAB) performance was investigated.

AD-A027 581/8GA PC$8.00/MF$3.00
Aerojet Solid Propulsion Co Sacramento Calif
Design and Test of the Operational In-Situ Gage for Solid Propellant Surveillance.
Final rept. May 73-Nov 74,
Herman P. Briar, Kenneth W. Bills, Jr., and Richard A. Schapery. Jun 76, 140p ASPC-1064-26-F, AFRPL-TR-76-36
Contract F04611-73-C-0040
Prepared in cooperation with Laboratory Automation Services, Rancho Cordova, Calif. and Texas A and M Univ., College Station, Tex.

Descriptors: *Solid propellant rocket engines, Gages, Surveillance, *Rocket propellant grains, Telemeter systems, Instrumentation, Measurement, Mechanical properties, Modular construction, Viscoplastic properties.
Identifiers: Duomorph gages, Monitoring.

The objective of this program was to develop practical instrumentation hardware for solid rocket motor surveillance. The approach was to reduce to practice existing concepts of grain instrumentation and telemetry using a modular design concept in which each unit consists of a power source/transmitter module, a sensor, and a sensor-to-transmitter interface module. A previous program gave the Duomorph sensor, a device for making in-situ measurements of propellant moduli. The present program made improvements in the Duomorph design plus the development of a modular design for the telemetry units. This latter design permits the use of a wide range of devices for measuring the stress, strain, temperature or dynamic mechanical properties at a point in the grain. This report describes the Duomorph designs, their operation, and the supporting analyses. The telemetry modules are described with respect to their electronic circuits, packaging, installation and operational safety. Laboratory models of the Duomorph sensor have demonstrated a precision of about 2%. Several approaches for improving this precision are discussed. Whether these refinements are needed will depend upon the accuracy required for a given application. Analyses performed to establish the relationship between Duomorph output data and the viscoelastic properties of the continuum are presented.

AD-A027 682/4GA PC$4.00/MF$3.00
Hercules Inc Cumberland Md Allegany Ballistics Lab
Mk 58 Rocket Motor Remote Arm/Fire Device.
Final rept. Sep 75-May 76.
15 Jun 76, 29p Rept no. AO-4066-154-01-002
Contract N00019-76-C-0126

Descriptors: *Solid propellant rocket engines, *Safety and arming(Ordnance), Remote control, Fire control systems, *Guided missile components, Prototypes, Guided missiles, Surface launching, Surface to air missiles, Actuators, Solenoids, Pressure, Sleeves, Rotary switches.
Identifiers: Mark-58 motors, Sea sparrow.

Contract N00019-76-C-0126 was awarded by NAVAIR to Hercules/ABL with the objective of defining and evaluating remote only type arm and fire mechanisms for application on the surface launched AIM-7F Sparrow. All the program design evaluation and delivery goals were met. A series of four arm/fire devices were designed and evaluated in Phase I with respect to a series of predefined system design specifications and functional requirements. Hercules completed a system rating study of the four devices and recommended two potential systems for the second phase design study. Final selection of an arm/fire device for the Phase II prototype design effort was completed by NAVSEA. The rotary solenoid/pressure sleeve type device was selected based upon potential superior performance of this system under a 40-foot drop environment.

N76-25342/8GA PC$5.00/MF$3.00
Acurex Corp., Mountain View, Calif. Aerotherm Div.
Unified Computer Codes: Properties Data for Low Cost Nozzle Materials.
E. Chu, H. Tong, and R. Bedard. Mar 76, 78p
NASA-CR-144315, TR-76-9
Contract NAS8-30264

Descriptors: *Computer programs, *Materials science, *Nozzle walls, Characterization, Decomposition, Heat of formation, Materials tests, Reaction kinetics, Specific heat, Thermal conductivity.

For abstract, see STAR 1416

21I. Rocket Propellants

AD-A027 217/9GA PC$11.00/MF$3.00
Exxon Research and Engineering Co Linden N J Government Research Lab
External Catalyst Breakup Phenomena.
Final rept. Jun 74-Jan 76,
William F. Taylor, John D. Kuenzly, William T. Webber, and Robert L. Sacheim. Jun 76, 417p EXXON/GRU.2BF.76, AFRPL-TR-76-47
Contract F04611-74-C-0032
Prepared in cooperation with McDonnell Douglas Astronautics Co., Huntington Beach, Calif., and TRW Systems Group, Inc., Redondo Beach, Calif. See also Rept. no. AFRPL-TR-75-68 dated Dec 75, AD-A022 243.

Descriptors: *Catalysts, *Degradation, *Monopropellants, Hydrazine, Thrusters, Life expectancy.
Identifiers: Shell 405 catalyst.

The overall objective of the work in the program was to investigate the external breakup mechanisms of Shell 405 catalyst so as to establish an understanding of the phenomenon in order to provide monopropellant hydrazine thruster designers with a fundamental technology base which they can use to achieve long life mission requirements. Following a review of the literature and other available information, twenty (20) different mechanisms or factors potentially significant to catalyst breakup were investigated either experimentally or analytically or by use of both techniques. Slightly more than half of the mechanisms investigated were found to have a significant influence on the complex phenomena involved in overall catalyst breakup. The significant primary catalyst breakup mechanisms were in general, associated with either pressure crushing forces or with various effects resulting from the presence of liquid hydrazine. A major secondary breakup mechanism is particle to particle abrasion which can occur if the catalyst in a voided bed experiences rapid motion. Another important factor in catalyst breakup is the deterioration as a result of thruster exposure of the ability of a fresh catalyst to resist the various breakup mechanisms. Results also indicate that the effect of the various mechanisms on the magnitude of breakup can be controlled by adjusting reactor operating variables such as liquid injection velocities, bed temperature, bed gas linear velocity and pressure drop, bed preload and catalyst selection for the various sections of a thruster and point to a number of variables or factors involved in thruster operation where operating envelopes or procedures could be developed to enhance catalyst life.

AD-A027 299/7GA PC$5.50/MF$3.00
Ogden Air Logistics Center Hill AFB Utah Propellant Lab Section
Propellant Surveillance Report LGM-30 F and G Stage I Phase B, Series III TP-H1011.
Semi-annual test results,
John A. Thompson. Jun 76, 121p Rept no. MANCP-345(76)

Descriptors: Booster rocket engines, *Solid propellant rocket engines, *Solid rocket propellants, Statistical analysis, Storage, Regression analysis, Surveillance, Aging(Materials), Physical properties, Tensile properties, Triaxial stresses, Strain(Mechanics), Computer applications.
Identifiers: TP-H011 rocket propellants, Minuteman, Minuteman 3 missiles, *Surface to surface missiles.

This report contains propellant test results from cartons of TP-H1011 bulk propellant representing LGM-30 First Stage Minuteman Motors. This report uses a statistical approach to analyze the bulk carton propellant data. Testing was accomplished in accordance with MMEMP Project M72632-5MP116P. The data from this test period are combined with data from previous testing and entered into the GO85 Computer for storage, analysis and regression analysis. From the statistical analysis of all data tested to date (11 years for F and G), significant degradation of the propellant does not appear likely for at least two years past the oldest data point. Each point on the regression plot represents the mean of all samples at that particular age. The number of samples at each point is indicated on the sample size summary sheet on the page accompanying each regression plot or group of regression plots. The data range at any age can be found by suitable inquiry of the GO85 system. (Author)

N76-25433/3GA PC$7.75/MF$3.00
Fitzgerald (J. E.) and Associates, Atlanta, Ga.
Development of a Solid Propellant Viscoelastic Dynamic Model.
Final Report.
W. L. Hufferd, and J. E. Fitzgerald. Apr 76, 221p NASA-CR-144316
Contract NAS8-31342

Descriptors: *Dynamic characteristics, *Dynamic models, *Solid rocket propellants, *Space shuttle orbiters, Case bonded propellants, Computer programs, Curve fitting, Damping, Least squares method, Scaling laws, Temperature effects.

For abstract, see STAR 1416

22. SPACE TECHNOLOGY

22A. Astronautics

AD-B004 662/1GA PC$4.00/MF$3.00
Analytic Services Inc Falls Church VA
Current and Projected Government and Commercial Space Activities.
Defense div. note,
J. S. Patton. Apr 75, 45p Rept no. ANSER-DDN-75-3
Contract F44620-69-C-0014
Distribution limitation now removed.

Descriptors: (*Space sciences, Reviews), Forecasting, Scientific research, Commerce, International, Peacetime, Industrial research, Government(Foreign), United States Government, Space shuttles, Space transportation, Technology, Space exploration, Remote detectors, Natural resources, Meteorological satellites, Communication satellites, Mapping, Monitoring, Space environments, Scientific satellites, Military planning, Military applications.
Identifiers: Nonmilitary applications.

This note is a summary of the growing national and international use of outer space for peaceful purposes by government and commercial activities. Emphasis is placed on: (1) The coming use of the space shuttle as a lower cost, more efficient space transportation system; and (2) The real and potential benefits that civilian space applications represent in meeting domestic and global economic, energy, and environmental needs. Of special significance are programs incorporating remote sensing systems, such as earth resources and meteorological satellites. The highlights of scientific knowledge obtained from space also are covered. The study concludes by examining the industrial and commercial employment of space now and in the future. This note was prepared to furnish background information in projecting future military exploitation in the space medium. (Author)

N76-25305/3GA PC$4.00/MF$3.00
McDonnell-Douglas Astronautics Co., Houston, Tex. Astronautics Div.
Maximization of Orbiter Altitude at Alt Interface Airspeed, Mission Planning, Mission Analysis and Software.
G. M. Glenn. 31 May 76, 29p NASA-CR-147752
Contract NAS9-14960

Descriptors: *Airspeed, *Altitude control, *Space shuttle orbiters, *Stage separation, Flight control, Free flight, Incidence, Mission planning, Optimization.

For abstract, see STAR 1416

N76-25312/9GA PC$4.00/MF$3.00
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
Addendum Report to Atmospheric Science Facility Pallet-Only Mode Space Transportation System Payload Feasibility Study, Volume 3, Revision a.
Jun 76, 50p NASA-TM-X-73008, JSC-10683-V-3-REV-A

Descriptors: *Atmospheric chemistry, *Payloads, *Space transportation, Airborne/spaceborne computers, Data processing, Feasibility analysis, Space shuttles, Spacecraft control.

For abstract, see STAR 1416

N76-25332/7GA PC$5.00/MF$3.00
TRW Systems Group, Redondo Beach, Calif.
Phase B: Final Definition and Preliminary Design Study for the Initial Atmospheric Cloud Physics Laboratory (ACPL): A Spacelab Mission Payload.
O. W. Clausen. 27 Jan 76, 100p NASA-CR-144170
Contract NAS8-31844

Descriptors: Atmospheric physics, Cloud physics, Design analysis, Payloads, *Space missions, *Spacelab, Aerospace environments, Research facilities, Weightlessness.

For abstract, see STAR 1416

N76-25794/8GA PC$3.50/MF$3.00
Agnew Tech-Tran, Inc., Woodland Hills, Calif.
A Scientific Dialog Between the Leading Space Powers.
R. Z. Sagdeyev, and G. M. Frank. Jun 76, 12p NASA-TT-F-15463
Contract NASW-2789
Tran-Transl. into English from Priroda (Usar), No. 2, Feb. 1976 p 147-151.

Descriptors: *Aerospace medicine, *Exobiology, *Manned space flight, *Space exploration, Life support systems, Nasa programs, U.s.s.r. space program.
Identifiers: Translations.

For abstract, see STAR 1416

N76-25934/0GA PC$4.00/MF$3.00
Teledyne Brown Engineering, Huntsville, Ala. Systems Analysis Dept.
Results of an Analytical Study of Spacecraft Deposition Contamination by Internal Reflection Spectroscopy.
Final Report.
T. Mookherji. 31 Mar 76, 33p NASA-CR-144330, MS-MSFC-1981
Contract NAS8-29750

Descriptors: Haze, *Space debris, *Spacecraft contamination, *Spectroscopic analysis, Windows (Apertures), Absorption spectra, Coatings, Condensates, Desorption, Optical properties, *Outgassing, Silicones, Surface properties, Ultraviolet radiation.

Identifiers: Internal reflection spectroscopy.
For abstract, see STAR 1416

22B. Spacecraft

N76-25212/1GA PC$9.25/MF$3.00
Singer Co., Binghamton, N.Y.
SMS Design Review Summary Report: Preliminary, NASA Approval Pending, Type 1 Data.
30 Apr 76, 296p NASA-CR-147724, JSC-10991
Contract NAS9-14910

Descriptors: Design analysis, *Space shuttles, *Spacecraft cabin simulators, Control boards, Control simulation, Spacecraft design, Spacecraft power supplies.

For abstract, see STAR 1416

N76-25307/9GA PC$3.50/MF$3.00
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Placement of Retroreflectors on the Lageos Satellite.
J. E. Moore. May 76, 9p NASA-TM-X-73302

Descriptors: *Lageos (Satellite), *Retroreflection, Euclidean geometry, Spheres.

For abstract, see STAR 1416

N76-25308/7GA PC$3.50/MF$3.00
Transemantics, Inc., Washington, D.C.
Launchings of Spacecrafts in the USSR (November - December 1975).
Jun 76, 7p NASA-TT-F-15483
Contract NASW-2792
Tran-Transl. into English from Priroda (Ussr), No. 4, Apr. 1976 p 136-137.

Descriptors: *Molniya satellites, *Onboard equipment, *Spacecraft launching, USSR, Meteorological satellites, Tables (Data), Telecommunication, Television systems.
Identifiers: Translations.

For abstract, see STAR 1416

N76-25316/6GA PC$4.00/MF$3.00
ARO, Inc., Arnold Air Force Station, Tenn. Von Karman Gas Dynamics Facility.
Heat-Transfer Tests of a 0.0175-Scale Model of the Space Shuttle at Mach Numbers 2.5, 3.5, 4.5 and 5.5.
Final Report, 31 Mar. - 21 May 1975.
K. W. Nuti, and W. R. Martindale. Jun 76, 35p NASA-CR-148164, ARO-VKF-TR-75-141
Subm-Sponsored by NASA.

Descriptors: *External tanks, *Heat transfer, Shock heating, *Space shuttles, Wind tunnel tests, Climbing flight, Noses (Forebodies), Rates (Per time), Scale models, Space shuttle boosters, Thermocouples.

For abstract, see STAR 1416

N76-25318/4GA PC$5.50/MF$3.00
Martin Marietta Corp., Denver, Colo.
Computer Program System for Dynamic Simulation and Stability Analysis of Passive and Actively Controlled Spacecraft. Volume 1. Theory.
Final Report.
C. S. Bodley, D. A. Devers, and C. A. Park. Apr 75, 113p NASA-CR-144758, MCR-75-17-V-1
Contract NAS5-11996
Seri-4.

Descriptors: Computer programs, Control simulation, *Dynamic characteristics, *Spacecraft control, Attitude control, Control theory, Digital computers, Equations of motion, Gravitational effects, Kinematics, Mathematical models, Printouts, Spacecraft motion, Topology.

For abstract, see STAR 1416

N76-25320/2GA PC$6.75/MF$3.00
Martin Marietta Corp., Denver, Colo.
Computer Program System for Dynamic Simulation and Stability Analysis of Passive and Actively Controlled Spacecraft. Volume 2: Program User'S Guide.
Final Report.
C. S. Bodley, D. A. Devers, and C. A. Park. Apr 75, 152p NASA-CR-144759, MCR-75-17-V-2
Contract NAS5-11996
Seri-4.

Descriptors: Computer programs, Control simulation, *Dynamic characteristics, *Spacecraft control, Attitude control, Control theory, Digital computers, Equations of motion, Gravitational effects, Kinematics, Mathematical models, Printouts, Spacecraft motion, Topology.

For abstract, see STAR 1416

N76-25321/0GA PC$12.50/MF$3.00
Martin Marietta Corp., Denver, Colo.
Computer Program System for Dynamic Simulation and Stability Analysis of Passive and Actively Controlled Spacecraft. Volume 3: Demonstration Problems.
Final Report.
C. S. Bodley, D. A. Devers, and C. A. Park. Apr 75, 481p NASA-CR-144760, MCR-75-17-V-3
Contract NAS5-11996
Seri-4.

Descriptors: Computer programs, Control simulation, *Dynamic characteristics, *Spacecraft control, Attitude control, Control theory, Digital computers, Equations of motion, Gravitational effects, Kinematics, Mathematical models, Printouts, Spacecraft motion, Topology.

For abstract, see STAR 1416

N76-25322/8GA PC$18.75/MF$3.00
Chrysler Corp., New Orleans, La. Data Management Services.
Results of an Aerodynamic Investigation of a Space Shuttle Orbiter/747 Carrier Flight Test Configuration to Determine Separation Characteristics Utilizing 0.0125-Scale Models (48-0/Ax1316I-1) in the LTV 4 X 4 Foot High Speed Wind Tunnel (CA26), Volume 1.
Aerothermodynamic Data Report.
R. L. Gillins. Apr 76, 742p NASA-CR-144612, DMS-DR-2273-V-1
Contract NAS9-13247
Seri-5.

Descriptors: *Aerodynamic characteristics, *Boeing 747 aircraft, Flight tests, High speed, Scale models, Separation, *Space shuttle orbiters, Wind tunnels, Proximity, Wind tunnel tests.

For abstract, see STAR 1416

N76-25323/6GA PC$18.75/MF$3.00
Chrysler Corp., New Orleans, La. Data Management Services.
Results of an Aerodynamic Investigation of a Space Shuttle Orbiter/747 Carrier Flight Test Configuration to Determine Separation Characteristics Utilizing 0.0125-Scale Models (48-0/Ax1316I-1) in the LTV 4 X 4 Foot High Speed Wind Tunnel (CA26), Volume 2.
Aerothermodynamic Data Report.
R. L. Gillins. Apr 76, 750p NASA-CR-144613, DMS-DR-2273-V-2
Contract NAS9-13247
Seri-5.

Descriptors: Aerodynamic characteristics, *Boeing 747 aircraft, *Flight tests, High speed, Scale models, Separation, *Space shuttle orbiters, Wind tunnels, Proximity, Wind tunnel tests.

For abstract, see STAR 1416

N76-25324/4GA PC$18.75/MF$3.00
Chrysler Corp., New Orleans, La. Data Management Services.
Results of an Aerodynamic Investigation of a Space Shuttle Orbiter/747 Carrier Flight Test Configuration to Determine Separation Characteristics Utilizing 0.0125-Scale Models (48-0/Ax1316I-1) in the LTV 4 X 4-Foot High Speed Wind Tunnel (CA26), Volume 3.
Aerothermodynamic Data Report.
R. L. Gillins. Apr 76, 752p NASA-CR-144614, DMS-DR-2273-V-3
Contract NAS9-13247
Seri-5.

Descriptors: Aerodynamic characteristics, *Boeing 747 aircraft, *Flight tests, High speed, Scale models, Separation, *Space shuttle orbiters, Wind tunnels, Proximity, Wind tunnel tests.

For abstract, see STAR 1416

N76-25325/1GA PC$18.75/MF$3.00
Chrysler Corp., New Orleans, La. Data Management Services.
Results of an Aerodynamic Investigation of a Space Shuttle Orbiter/747 Carrier Flight Test Configuration to Determine Separation Characteristics Utilizing 0.0125-Scale Models (48-0/Ax1318I-1) in the LTV 4 X 4 Foot High Speed Wind Tunnel (CA26), Volume 4.
Aerothermodynamic Data Report.
R. L. Gillins. Apr 76, 798p NASA-CR-144615, DMS-DR-2273-V-4
Contract NAS9-13247
Seri-5.

Descriptors: Aerodynamic characteristics, *Boeing 747 aircraft, *Flight tests, High speed, Scale models, Separation, *Space shuttle orbiters, Wind tunnels, Proximity, Wind tunnel tests.

For abstract, see STAR 1416

N76-25326/9GA PC$18.75/MF$3.00
Chrysler Corp., New Orleans, La. Data Management Services.
Results of an Aerodynamic Investigation of a Space Shuttle Orbiter/747 Carrier Flight Test Configuration to Determine Separation Characteristics Utilizing 0.0125-Scale Models (48-0/Ax1311I-1) in the LTV 4 X 4 Foot High Speed Wind Tunnel (CA26), Volume 5.
Aerothermodynamic Data Report.
R. L. Gillins. Apr 76, 758p NASA-CR-144616, DMS-DR-2273-V-5
Contract NAS9-13247
Seri-5.

Descriptors: Aerodynamic characteristics, *Boeing 747 aircraft, *Flight tests, High speed, Scale models, Separation, *Space shuttle orbiters, Wind tunnels, Proximity, Wind tunnel tests.

For abstract, see STAR 1416

N76-25327/7GA PC$4.00/MF$3.00
Columbia Univ., New York. Dept. of Civil Engineering and Engineering Mechanics.
Response of Space Shuttle Insulation Panels to Acoustic Noise Pressure.
Final Report.
R. Vaicaitis. Jun 76, 48p NASA-CR-148201, FR-2
Grant NSG-1059

Descriptors: *Noise reduction, Normal density functions, Rayleigh-Ritz method, *Space shutties, Equations of motion, Insulation, Panels, Thermal protection.

For abstract, see STAR 1416

N76-25328/5GA PC$4.50/MF$3.00
Lockheed Missiles and Space Co., Sunnyvale, Calif.
Unsteady Aerodynamic Flow Field Analysis of the Space Shuttle Configuration. Part 1: Orbiter Aerodynamics.
L. E. Ericsson, and J. P. Reding. Mar 76, 71p NASA-CR-144332, LMSC-D057194-PT-1
Contract NAS8-30652

Descriptors: Aerodynamic characteristics, Flow distribution, *Space shuttle orbiters, Unsteady flow, Reattached flow, Slender wings, Steady flow, Structural failure, Transonic speed, Vortices.
Identifiers: Flow fields.

For abstract, see STAR 1416

N76-25329/3GA PC$4.50/MF$3.00
Lockheed Missiles and Space Co., Sunnyvale, Calif.
Unsteady Aerodynamic Flow Field Analysis of the Space Shuttle Configuration. Part 2: Launch Vehicle Aeroelastic Analysis.
J. P. Reding, and L. E. Ericsson. Mar 76, 75p NASA-CR-144333, LMSC-D057194-PT-2
Contract NAS8-30652

Descriptors: Aerodynamic characteristics, *Aeroelasticity, Flow distribution, *Launch vehicles, *Space shuttle orbiters, Unsteady flow, Computer programs, Inlet flow, Nonlinear systems, Oscillations.
Identifiers: Flow fields.

For abstract, see STAR 1416

N76-25330/1GA PC$4.50/MF$3.00
Lockheed Missiles and Space Co., Sunnyvale, Calif.
Unsteady Aerodynamic Flow Field Analysis of the Space Shuttle Configuration. Part 3: Unsteady Aerodynamics of Bodies with Concave Nose Geometries.
L. E. Ericsson, and J. P. Reding. Mar 76, 71p NASA-CR-144334, LMSC-D057194-PT-3
Contract NAS8-30652

Descriptors: *Aerodynamic characteristics, Concavity, Flow distribution, *Noses (Forebodies), *Space shuttle orbiters, Surface geometry, Unsteady flow, Mathematical models, Oscillations, Spikes (Aerodynamic configurations).
Identifiers: Flow fields.

For abstract, see STAR 1416

N76-25331/9GA PC$4.50/MF$3.00
Lockheed Missiles and Space Co., Sunnyvale, Calif.
Unsteady Aerodynamic Flow Field Analysis of the Space Shuttle Configuration. Part 4: 747/Orbiter Aeroelastic Stability.
J. P. Reding, and L. E. Ericsson. Mar 76, 53p NASA-CR-144335, LMSC-D057194-PT-4
Contract NAS8-30652

Descriptors: Aerodynamic characteristics, *Aeroelasticity, *Boeing 747 aircraft, Flow distribution, *Space shuttle orbiters, Stability, Unsteady flow, Aircraft wakes, Interference, Undamped oscillations.

For abstract, see STAR 1416

N76-25333/5GA PC$16.25/MF$3.00
Chrysler Corp., New Orleans, La. Space Div.
Results of an Experimental Investigation to Determine Separation Characteristics for the Orbiter/747 Using a 0.0125-Scale Model (48-0 Ax1318i-1 747) in the Ames Research Center 14-Foot Wind Tunnel (CA23B), Volume 1.
V. Esparza. Apr 76, 630p NASA-CR-144603, DMS-DR-2275-V-1
Contract NAS9-13247

Descriptors: *Boeing 747 aircraft, Scale models, *Space shuttle orbiters, Wind tunnel tests, *Aerodynamic characteristics, Angle of attack, Control surfaces, Photographs, Piggyback systems, Tables (Data).
Identifiers: Separation.

For abstract, see STAR 1416

N76-25334/3GA PC$18.75/MF$3.00
Chrysler Corp., New Orleans, La. Space Div.
Results of an Experimental Investigation to Determine Separation Characteristics for the Orbiter/747 Using a 0.0125-Scale Model (48-0 Ax1318i-1 747) in the Ames Research Center 14-Foot Wind Tunnel (CA23B).
V. Esparza. Apr 76, 741p NASA-CR-144604, DMS-DR-2275-V-2
Contract NAS9-13247

Descriptors: *Boeing 747 aircraft, Scale models, Separation, *Space shuttle orbiters, Wind tunnel tests, *Aerodynamic characteristics, Control surfaces.

For abstract, see STAR 1416

N76-25335/0GA PC$4.00/MF$3.00
McDonnell-Douglas Technical Services Co., Inc., Houston, Tex. Astronautics Div.
Analysis of Effect of Internal and Operating Variables on Performance of SVDS Constraint Model (ABIND).
J. R. Pendergrass, and R. L. Walsh. 26 Jun 75, 35p NASA-CR-147770
Contract NAS9-13970

Descriptors: Coefficient of friction, *External store separation, Oscillation dampers, *Spacecraft, Computerized simulation, Dynamic models, Equations of motion, Pitch (Inclination), Torque.

For abstract, see STAR 1416

N76-25336/8GA PC$3.50/MF$3.00
McDonnell-Douglas Corp., St. Louis, Mo.
Evaluation of TILS for Use as the Orbiter Landing Navaid.
J. M. Tate. 23 Oct 74, 18p NASA-CR-147773
Contract NAS9-13970

Descriptors: *Instrument landing systems, Navigation aids, *Space shuttle orbiters, Automatic landing control, Distance measuring equipment, Equipment specifications, Landing aids, Space shuttles.

For abstract, see STAR 1416

N76-25341/6GA PC$4.00/MF$3.00
McDonnell-Douglas Corp., St. Louis, Mo.
Mia Computer Simulation Test Results Report.
G. E. Unger. 19 Nov 74, 26p NASA-CR-147772
Contract NAS9-13970

Descriptors: *Avionics, Computerized simulation, *Space shuttles, Computer programs, Receivers, Signal to noise ratios, Systems engineering.

For abstract, see STAR 1416

22C. Spacecraft Trajectories and Reentry

AD-A027 574/3GA PC$4.00/MF$3.00
Royal Aircraft Establishment Farnborough (England)
Miranda: Operations for Two 'Electronically Disturbed' Passes.
Technical rept.,
M. J. Hammond, E. A. R. Anstey, and E. Jones. Feb 76, 44p RAE-TR-76017, DRIC-BR-52041

Descriptors: *Scientific satellites, Command and control systems, *Satellite tracking systems, Data links, Real time, Telemeter systems, Space communications, Remote control, Malfunctions, Orbits, Great Britain.
Identifiers: Miranda satellites.

The operational activities at the RAE Satellite Control Centre on the mornings of 10 March and 21 May 1974 when the Miranda satellite was in an 'electronically disturbed' state are described. The controller returned the satellite to its planned state using automatic techniques within the timescale of each pass and thus prevented possible mission failure. (Author)

22D. Spacecraft Launch Vehicles and Ground Support

AD-A027 757/4GA PC$6.75/MF$3.00
General Dynamics/Convair San Diego Calif
Atlas SLV-3 Space Launch Vehicle Flight Evaluation Report SLV-3 7128.
14 Jul 67, 173p GDC-BKF67-035, SAMSO-TR-76-161
Contract AF 04(695)-826

Descriptors: *Launch vehicles, Launching, Flight testing, Ascent trajectories, Booster rocket engines, Separation, Sustainer engines, Pneumatic devices, Hydraulic equipment, Airframes, Flight control systems, Guidance, Counting, Propellant control, Electrical equipment, Orbits.
Identifiers: Atlas launch vehicles, SLV-3 launch vehicles, Atlas/Agena launch vehicles, MA-5 propulsion systems, Gemini.

Atlas 7128, the thirty-seventh Atlas boost vehicle to be used in support of this particular Atlas/Agena program, was successfully launched from SLC-4E on 4 June 1967. This was the ninety-third Atlas to be employed in the Atlas/Agena programs. The Atlas flight objectives were fully satisfied. The upper stage vehicle was boosted into the specified coast ellipse, Atlas/Agena separation was properly accomplished, and telemetry data were obtained for Atlas systems analysis. Fulfillment of the insertion parameters at the termination of Atlas powered flight placed the upper stage vehicle at the proper space position with the required velocity for continuation of the mission by the second stage Agena vehicle. GE/Burroughs guidance computer data indicated very close adherence to the inflight-calculated insertion parameters upon the termination of Atlas powered flight. The desired VECO insertion velocities are determined in flight as those required to achieve the preflight-specified coast ellipse from the actual flight path being followed by the Atlas in powered flight.

AD-A027 758/2GA PC$6.00/MF$3.00
General Dynamics/Convair San Diego Calif
Atlas SLV-3 Space Launch Vehicle Flight Evaluation Report SLV-3 5306.
17 Oct 66, 146p GDC-BKF66-060, SAMSO-TR-76-162
Contract AF 04(694)-240

Descriptors: *Launch vehicles, Launching, Flight testing, Ascent trajectories, Booster rocket engines, Sustainer engines, Pneumatic

devices, Hydraulic equipment, Airframes, Flight control systems, Guidance, Counting, Propellant control, Separation, Electrical equipment, Orbits.
Identifiers: Atlas launch vehicles, SLV-3 launch vehicles, Atlas/Agena launch vehicles, MA-5 propulsion systems, Gemini.

Atlas SLV-3 5308, the sixth Atlas SLV-3 to be used in support of this particular program, was successfully launched from AFETR, Complex 14, on 12 September 1966. This was the seventy-ninth Atlas to be employed in the Atlas/Agena program. The Atlas objectives were fully satisfied. The upper stage vehicle was boosted into the specified coast ellipse, Atlas/Agena separation was properly accomplished, and data were obtained for Atlas flight analysis. The operation of all Atlas systems was satisfactory throughout flight. Fulfillment of the insertion parameters at the termination of Atlas powered flight placed the upper stage vehicle at the proper space position with the required velocity for continuation of the mission by the second stage Agena vehicle. GE/Burroughs guidance computer data indicated very close adherence to the inflight-calculated insertion parameters upon the termination of Atlas powered flight. The desired VECO insertion velocities are determined in flight as those required to achieve the preflight-specified coast ellipse from the actual flight path being followed by the Atlas in powered flight.

AD-A027 759/0GA PC$8.00/MF$3.00
General Dynamics/Convair San Diego Calif
Atlas SLV-3 Space Launch Vehicle Flight Failure Investigation SLV-3 5303.
27 Sep 66, 238p GDC-BKF66-041, SAMSO-TR-76-163
Contract AF 04(694)-240

Descriptors: *Launch vehicles, Launching, Flight testing, Ascent trajectories, Failure(Mechanics), Pitch(Inclination), Counting, Abort.
Identifiers: Atlas launch vehicles, SLV-3 launch vehicles, Atlas/Agena launch vehicles, MA-5 propulsion systems, Gemini.

Vehicle 5303 (the third Gemini target launch vehicle) was launched from Cape Kennedy, Complex 14, on May 17 at 1015: 03.422 EST. The flight was unsuccessful due to a loss of Atlas pitch control after 120 seconds of flight. The subsequent abnormal trajectory resulted in an impact of the Atlas sustainer section at 107 nautical miles from Cape Kennedy in a northeasterly direction. As a result, the upper stage Agena vehicle was not in a trajectory which could result in orbital injection and Agena engine start was inhibited by a Range Safety command.

AD-A027 760/8GA PC$6.75/MF$3.00
General Dynamics/Convair San Diego Calif
Review of Functional and Qualification Testing for SLV-3 General Electric Guidance System,
D. V. Quinby, and M. H. Scott. Oct 66, 171p GDC-BNZ66-041, SAMSO-TR-76-164
Contract AF 04(695)-710

Descriptors: *Launch vehicles, Radio beacons, Decoders, Ground support equipment, Environmental tests, Functional analysis, Yaw, Voltage, Pitch(Motion), Acceptance tests.
Identifiers: *Radio guidance, SLV-3 launch vehicles, Atlas launch vehicles.

The Associate Contractor Test Integration task entailed studies of the SLV-3 airborne Radio Guidance System test program. The purpose of these studies was to review and analyze the Radio Guidance System test program for compliance and compatibility with the SLV-3 performance objectives and to recommend changes in the test program for increasing confidence that these objectives will be fulfilled. This report contains analyses of environmental and functional tests at the associate contractor factory through prelaunch testing at the launch site.

AD-A027 761/6GA PC$6.75/MF$3.00
General Dynamics/Convair San Diego Calif
Atlas SLV-3 Space Launch Vehicle Flight Evaluation Report SLV-3 7123.
26 Oct 66, 153p Rept no. GDC-BKF66-062
Contract AF 04(694)-240

Descriptors: *Launch vehicles, Launching, Flight testing, Ascent trajectories, Booster rocket engines, Separation, Sustainer engines, Pneumatic devices, Hydraulic equipment, Airframes, Flight control systems, Guidance, Countdown, Propellant control, Electrical equipment, Orbits.
Identifiers: Atlas launch vehicles, SLV-3 launch vehicles, Atlas/Agena launch vehicles, MA-5 propulsion systems, Gemini.

Atlas 7123, the thirty-first Atlas boost vehicle to be used in support of this particular Atlas/Agena program, was successfully launched from SLC-4E on 16 September 1966. This was the eightieth Atlas to be employed in the Atlas/Agena programs. The Atlas flight objectives were fully satisfied. The upper stage vehicle was boosted into the specified coast ellipse, Atlas/Agena separation was properly accomplished, and telemetry data were obtained for Atlas systems analysis. The operation of all Atlas systems was satisfactory throughout flight. Fulfillment of the insertion parameters at the termination of Atlas powered flight placed the upper stage vehicle at the proper space position with the required velocity for continuation of the mission by the second stage Agena vehicle. All Atlas mission objectives were satisfied. The desired VECO insertion velocities are determined in flight as those required to achieve the preflight-specified coast ellipse from the actual flight path being followed by the Atlas in powered flight.

AD-A027 762/4GA PC$13.75/MF$3.00
General Dynamics/Convair San Diego Calif
Difficulties Review Atlas Booster Airborne and Ground Support Systems. Book II. General Information. Volume III. Autopilot System Airborne Difficulties Review.
15 Aug 66, 585p GDC-BRW66-013-Bk-2-Vol-3, SAMSO-TR-76-166
Contract AF 04(695)-710
See also Book 2, Volume 4, AD-A027 768.

Descriptors: *Launch vehicles, *Booster rocket engines, Airborne, Automatic pilots, Failure(Electronics), Gyroscopes, Checkout procedures, Modes, Time, Tolerances(Mechanics), Power supplies, Amplifiers, Switches, Reviews.
Identifiers: *Atlas launch vehicles, Difficulties review, Programmers(Electronics), Atlas boosters, Atlas.

No abstract available.

AD-A027 763/2GA PC$9.00/MF$3.00
General Dynamics/Convair San Diego Calif
Range Safety Trajectory and Dispersion Information for Atlas 89D/OV1-9 and 10,
W. A. Pence, Jr. 21 Oct 66, 251p GDC-BKM66-035, SAMSO-TR-76-167
Contract AF 04(694)-751

Descriptors: *Launch vehicles, *Range safety, Guided missile ranges, Guided missile trajectories, Artificial satellites, Impact, Radar tracking, Atmosphere entry, Crosswinds, Failure, Fuel consumption, Guided missile tracking systems.
Identifiers: *Atlas launch vehicles, Atlas, Ballistic coefficients, OV-1 satellites, Mod-3 guidance system.

The Range Safety Office, Western Test Range, requires the following information about each flight: (1) Reference, fast, slow, and crossrange dispersion trajectories with impacts for premature cutoffs. (2) Maximum turning capability of the velocity vector. (3) Expected effects of destruction action on the vehicle and the ballistic coefficients of the resulting pieces. (4) Expected impact point and ballistic coefficient for each reentering body. (5) Impact dispersion for each stage. (6) Conditions for burning on reentry. (7) Typical failures that may occur during flight and trajectory deviations beyond which the launching agency is no longer interested in the flight. (8) Maximum possible impact range assuming complete fuel consumption of all stages. (9) Tracking equipment installed on the missile that can be used for range safety purposes. (10) Dispersed trajectories due to effects of severe headwinds and crosswinds. This and referenced reports provide the range safety information for Atlas 89D/OV1-9 and 10 to be launched from Vandenberg Air Force Base to a target in the South Pacific Ocean. (Author)

AD-A027 764/0GA PC$7.75/MF$3.00
General Dynamics/Convair San Diego Calif
Difficulties Review Atlas Booster Airborne and Ground Support Systems. Book I. General Information.
15 Aug 66, 220p GDC-BRW66-013-Bk-1, SAMSO-TR-76-168
Contract AF 04(695)-710
See also Book 2, AD-A027 765.

Descriptors: *Launch vehicles, *Booster rocket engines, Ground support equipment, Failure(Electronics), Air conditioning equipment, Automatic pilots, Electrical equipment, Flight control systems, Guidance, Hydraulic equipment, Instrumentation, Guided missile launchers, Pneumatic devices, Propulsion systems, Towers, Interfaces, Reviews.
Identifiers: *ATLAS launch vehicles, Difficulties review, Atlas, Atlas boosters.

The Difficulties Review encompasses problems gathered from the factory, the field, (ETR and WTR) and UTP. The factory difficulties are limited to 'selloff' and rerun composite testing. In the UTP area, the difficulties were excerpted from Central Test Control Reports, Problem Reports, Supplementary History Sheets and Problem Review Reports. Field problems for the Difficulties Review have been limited to captive flights, flight readiness firings, actual countdown dual propellant loading, quad tanking, component reliability testing, and flightacceptance composite tests. Difficulties called out in the search for critical weakness program was not documented. GSE problems shall be limited to ETR Complex 12, 13, 36A and 36B for the present edition. Hereafter only booster difficulties shall be maintained. Failure analysis reports cover difficulties from the field and factory and may complement the information above. The GSE Difficulties Review, Book 1 contains 14 Volumes, one volume for each system, under one cover. Each volume is appropriately indexed.

AD-A027 765/7GA PC$13.50/MF$3.00
General Dynamics/Convair San Diego Calif
Difficulties Review Atlas Booster Airborne and Ground Support Systems. Book II. General Information. Volume VIII. Instrumentation System Airborne Difficulties Review.
15 Aug 66, 554p GDC-BRW66-013-Bk-2-Vol-8, SAMSO-TR-76-169
Contract AF 04(695)-710
See also Book 2, Volume 13, AD-A027 767.

Descriptors: *Launch vehicles, *Booster rocket engines, Airborne, Instrumentation, Failure, Telemeter systems, Transducers, Flight testing, Captive tests, Guided missile batteries, Accelerometers, Semiconductor devices, Guided

missile antennas, Couplers, Power equipment, Reviews.
Identifiers: *Atlas launch vehicles, Difficulties review, Atlas boosters, Atlas.

Contents: Landline; Power Source; Telemetry Set and Measurement; and Antenna and Coupler.

AD-A027 766/5GA PC$7.75/MF$3.00
General Dynamics/Convair San Diego Calif
Difficulties Review Atlas Booster Airborne and Ground Support Systems. Book II. General Information. Volume V. Electrical System Airborne Difficulties Review.
15 Aug 66, 219p GDC-BRW66-013-Bk-2-Vol-50, SAMSO-TR-76-170
Contract 0AF 04(695)-7100
See also Book 2, Volume 6, AD-A027 768.

Descriptors: *Launch vehicles, *Booster rocket engines, Airborne, Electrical equipment, Electronic equipment, Failure(Electronics), Modes, Power supplies, Guided missile batteries, Inverters, Radiation hardening, Electric connectors, Time, Reviews.
Identifiers: *Atlas launch vehicles, Difficulties review, Atlas boosters, Atlas.

Contents: Power Source; and Power Distribution.

AD-A027 767/3GA PC$5.00/MF$3.00
General Dynamics/Convair San Diego Calif
Difficulties Review Atlas Booster Airborne and Ground Support Systems. Book II. General Information. Volume XIII. Range Safety Command System Airborne Difficulties Review.
15 Aug 66, 78p GDC-BRW66-013-Bk-2-Vol-130, SAMSO-TR-76-171
Contract 0AF 04(695)-7100
See also Book 2, Volume 2, AD-A027 768.

Descriptors: *Launch vehicles, *Booster rocket engines, Airborne, Guided missile ranges, *Range safety, Guided missile safety, Command and control systems, Failure(Electronics), Arming devices, Guided missile antennas, Couplers, Time, Failure(Mechanics), Modes, Destructors, Reviews.
Identifiers: *Atlas launch vehicles, Difficulties review, Atlas boosters, Atlas.

Contents: Command; Destructor; Arming Device; Power and Signal Control Unit; and Antenna, Coupler, and Receiver.

AD-A027 768/1GA PC$5.50/MF$3.00
General Dynamics/Convair San Diego Calif
Difficulties Review Atlas Booster Airborne and Ground Support Systems. Book II. General Information. Volumes II, IV and VI. Abort Sensing and Implementation Auxiliary Power Source Guidance, Airborne Difficulties Review.
15 Aug 66, 109p GDC-BRW66-013-Bk-2-Vol-2, 0GDC-BRW66-013-Bk-2-Vol-4, SAMSO-TR-76-172
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Descriptors: *Launch vehicles, *Booster rocket engines, Airborne, Abort, Auxiliary power plants, Guidance, Failure, Detectors, Control systems, Semiconductor devices, Decoders, Beacons, Guided missile computers, Modes, Captive tests, Flight testing, Reviews.
Identifiers: *Atlas launch vehicles, Difficulties review, Atlas boosters, Atlas.

No abstract available.

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EDA-05-06-01566
Dana Larson Roubal and Associates, Pierre, S. Dak.
PB-255 444/2GI 2C

EDA-07-8-01521
Squaxin Island Tribe, Shelton, Wash.
PB-255 122/4GI 6C

EPA-C-200526
Automotive Testing Labs., Inc., Aurora, Colo.
PB-255 559/7GI 13B

PB-255 560/5GI 13B

PB-255 561/3GI 13B

PB-255 585/4GI 13B

EPA-R-802396
City Coll., New York. Dept. of Chemistry.
PB-255 092/9GI 13B

EPA-68-01-0168
Oregon State Univ., Newport. Marine Science Center.
PB-255 504/3GI 6C

EPA-68-01-0324
Camp, Dresser and McKee, Inc., Boston, Mass.
PB-255 769/2GI 13B

EPA-68-01-0439
Automotive Testing Labs., Inc., Aurora, Colo.
PB-255 276/8GI 13B

EPA-68-01-0759
General Electric Co., Santa Barbara, Calif. TEMPO.
PB-255 492/1GI 8H

EPA-68-01-1061
Stanford Research Inst., Arlington, Va.
PB-255 117/4GI 21D

EPA-68-01-2413
Montana Univ., Missoula. Dept. of Geology.
PB-255 269/3GI 13B

EPA-68-01-2490
American Public Health Association, Washington, D.C.
PB-255 019/2GI 6E

EPA-68-01-2653
Montana Univ., Missoula. Dept. of Geology.
PB-255 272/7GI 8H

EPA-68-01-2951
Little (Arthur D.), Inc., Cambridge, Mass.
PB-255 695/9GI 13B

EPA-68-01-2971
Clean Water Consultants, El Dorado, Calif.
PB-255 217/2GI 13B

EPA-68-02-0048
Automotive Testing Labs., Inc., Aurora, Colo.
PB-255 559/7GI 13B

PB-255 560/5GI 13B

TRW, Inc., McLean, Va. Transportation and Environmental Operations.
PB-255 562/1GI 13B

EPA-68-02-1324
Midwest Research Inst., Kansas City, Mo.
PB-255 094/5GI 7A

EPA-68-02-1490
Southern Research Inst., Birmingham, Ala.
PB-255 095/2GI 13B

EPA-68-02-1749
Meteorology Research, Inc., Altadena, Calif.
PB-255 093/7GI 14B

EPA-68-02-2114
Southern Research Inst., Birmingham, Ala.
PB-255 297/4GI 13B

EPA-68-02-2315
Automotive Testing Labs., Inc., Aurora, Colo.
PB-255 558/3GI 13B

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EPA-68-03-0271
Syracuse Univ. Research Corp., N.Y. Life Sciences Div.
PB-255 432/7GI 6T

EPA-68-03-0443
National Inst. of Scientific Research, Rancho Santa Fe, Calif.
PB-256 103/4GI 13B

ERDA-75-S-134
Syracuse Univ., N.Y. Coll. of Engineering.
PB-255 488/9GI 13A

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AD-A027 581/8GI 21H

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Exxon Research and Engineering Co Linden N J Government Research Lab
AD-A027 217/9GI 21I

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California Inst of Tech Pasadena Guggenheim Jet Propulsion Center
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Aerospace Corp El Segundo Calif Aerophysics Lab
AD-A027 227/8GI 7D
AD-A027 497/7GI 20D
AD-A027 582/6GI 16B

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Arizona Univ Tucson Optical Sciences Center
AD-A027 358/5GI 20E

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Stanford Univ Calif Edward L Ginzton Lab
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Science Applications Inc Berkeley Calif
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Ohio State Univ Columbus Electroscience Lab
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Dayton Univ Ohio School of Engineering
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Rockwell International Canoga Park Calif Rocketdyne Div
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Webb Associates Inc Yellow Springs Ohio
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California Univ Berkeley Dept of Mechanical Engineering
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AD-A027 579/2GI 7D

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Science Applications Inc Atlanta Ga
AD-A027 195/7GI 14B

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Aeronautical Research Associates of Princeton Inc N J
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David Sarnoff Research Center Princeton N J
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PB-254 974/9GI 6H
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Urban Systems Research and Engineering, Inc., Cambridge, Mass.
PB-255 351/9GI 10A

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PB-255 321/2GI 13A

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Middle Atlantic Governors' Coastal Resources Council.
PB-254 925/1GI 8I

FEA-CO-03-50222-00
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PB-255 320/4GI 8I

FEA-CO-12-50509-00
National Association of Counties, Washington, D.C.
PB-255 452/5GI 13B

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Case Western Reserve Univ., Cleveland, Ohio. Engineering Design Center.
N76-25539/7GI 6B

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Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
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FMC Corp., San Jose, Calif. Mining Equipment Operations.
PB-252 101/1GI 8I

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Ocean Energy Inc., Blairsville, Pa.
PB-255 799/9GI 8I

HSM-110-72-298
Nebraska State Dept. of Health, Lincoln. Office of Comprehensive Health Planning.
HRP-0001908/3GI 6E

HSM-110-72-343
Arkansas Health Systems Foundation, Little Rock.
HRP-0000723/2GI 6E

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Arizona Univ., Tucson. Electrical Engineering Dept.
N76-25855/1GI 10B

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Hackman (J. Richard), Bethany, Conn.
PB-255 044/0GI 5I

L-74-78
Lewler (Edward E.), III, Pinckney, Mich.
PB-255 045/7GI 5I

L-74-80
Alderfer (Clayton P.), Bethany, Conn.
PB-255 046/5GI 5I

L-74-84
Strauss (George), Berkeley, Calif.
PB-255 047/3GI 5I

MA-5-39036
Hague International, South Portland, Maine.
PB-254 831/1GI 13A

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Stanford Research Inst Arlington Va Strategic Studies Center
AD-A027 223/7GI 5D

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Human Resources Research Organization Alexandria Va
AD-A027 507/3GI 5I

MDA903-76-C-0219
Caci Inc-Federal Arlington Va
AD-A027 420/9GI 5E

MDA903-76-C-0254
Informatics Inc Rockville Md
AD-A027 224/5GI 5B

N01-AM-2-2200
Mayo Clinic, Rochester, Minn.
PB-255 494/7GI 6E

N01-AM-3-2212
Washington Univ., Seattle. School of Medicine.
PB-255 654/6GI 6L

N01-AM-4-2202
Ralph K. Davies Medical Center, San Francisco, Calif. Dialysis Treatment and Research Center.
PB-255 291/7GI 6E

N01-AM-4-2210
Utah Univ., Salt Lake City. Div. of Artificial Organs.
PB-255 915/1GI 6P

N01-DH-44091
Pugh-Roberts Associates, Inc., Cambridge, Mass.
PB-254 772/7GI 6E

N01-DH-44093
Policy Analysis, Inc., Boston, Mass.
PB-254 771/9GI 6E

N01-HB-3-2910
Columbia Univ., , New York. Artificial Organs Research Lab.
PB-255 113/3GI 6L

N01-HB-4-2950
Emory Univ., Atlanta, Ga. Dept. of Physiology.
PB-255 694/2GI 6P

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Pennsylvania Univ., Philadelphia. Dept. of Anatomy and Histology.
PB-255 050/7GI 6A

N01-HR-4-2955
Pennsylvania Univ., Philadelphia. School of Medicine.
PB-255 026/7GI 6E

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Mayo Foundation, Rochester, Minn.
PB-254 967/3GI 6E
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Abt Associates, Inc., Cambridge, Mass.
PB-254 673/7GI 5I

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Vermont Univ., Burlington. Div. of Health Sciences.
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Little (Arthur D.), Inc., Cambridge, Mass.
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Carnegie-Mellon Univ Pittsburgh Pa Dept of Physics
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Utah Univ Salt Lake City
AD-A027 310/2GI 8G
Utah Univ Salt Lake City Dept of Geological and Geophysical Sciences
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Oregon State Univ Corvallis School of Oceanography
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Lehigh Univ Bethlehem Pa Dept of Physics
AD-A027 298/3GI 20L
AD-A027 443/1GI 20L

N00014-67-A-0387-0016
Hawaii Univ Honolulu Dept of Physiology
AD-A027 592/5GI 6S

N00014-67-A-0387-0017
Hawaii Inst. of Geophysics, Honolulu.
PB-255 653/8GI 8C

N00014-67-A-0438-0013
Polytechnic Inst of New York Brooklyn Dept of Electrical Engineering and Electrophysics
AD-A027 742/6GI 15E

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Polytechnic Inst of New York Farmingdale
AD-A027 681/6GI 17H
Polytechnic Inst of New York Farmingdale Dept of Electrical Engineering and Electrophysics
AD-A027 544/6GI 9D

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Center for Naval Analyses Arlington VA Inst of Naval Studies
AD-B008 573/8GI 5I

N00014-68-A-0173-0015
Florida Univ Gainesville Engineering and Industrial Experiment Station
AD-A027 634/5GI 7D

N00014-69-A-0200-0002
Scripps Institution of Oceanography San Diego Calif Marine Physical Lab
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Hawaii Inst of Geophysics Honolulu
AD-A027 593/3GI 8J
AD-A027 642/8GI 8G

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Woods Hole Oceanographic Institution Mass
AD-A027 736/8GI 17A

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Naval Dental Research Inst Great Lakes Ill
AD-A027 463/9GI 6E

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Avco Everett Research Lab Inc Everett Mass
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Kentucky Univ Lexington Dept of Community Medicine
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Battelle Columbus Labs Ohio
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Systems Research Labs Inc Newport News Va Rasa Div
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Woods Hole Oceanographic Institution Mass
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Undersea Medical Society Bethesda Md
AD-A027 172/6GI 6S

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Hughes Research Labs Malibu Calif
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Scripps Institution of Oceanography La Jolla Calif
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Michigan Univ Ann Arbor Cooley Electronics Lab
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Louisiana State Univ Baton Rouge Coastal Studies Inst
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California Inst of Tech Pasadena Div of Engineering and Applied Science
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Emory Univ Atlanta Ga
AD-A027 669/1GI 7D

N00014-75-C-0226
Rhode Island Univ Kingston Div of Engineering Research and Development
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West Virginia Univ Morgantown Dept of Aerospace Engineering
AD-A027 647/7GI 1A

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Westinghouse Electric Corp Pittsburgh Pa Research and Development Center
AD-A027 442/3GI 9A

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Rice Univ., Houston, Tex. Inst. for Computer Services and Applications.
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Stevens Inst of Tech Hoboken N J Davidson Lab
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Southern Methodist Univ Dallas Tex Dept of Industrial Engineering and Operations Research
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Case Western Reserve Univ Cleveland Ohio Dept of Mathematics and Statistics
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Texas A and M Univ College Station Dept of Oceanography
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New York Univ N Y Courant Inst of Mathematical Sciences
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California Univ Los Angeles School of Engineering and Applied Science
AD-A027 150/2GI 17B

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Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
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Rensselaer Polytechnic Inst Troy N Y Dept of Materials Engineering
AD-A027 264/1GI 7D

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Carnegie-Mellon Univ Pittsburgh Pa Dept of Physics
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University of Southern California Los Angeles Behavioral Technology Labs
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North Carolina Univ At Charlotte Coll of Business Administration
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Washington Univ Seattle Dept of Psychology
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Hughes Research Labs Malibu Calif
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California Inst of Tech Pasadena Div of Chemistry and Chemical Engineering
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Aerojet Electrosystems Co Azusa Calif
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Florida Univ Gainesville Dept of Physics
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Princeton Univ N J Dept of Chemical Engineering
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Lehigh Univ Bethlehem Pa Center for the Application of Mathematics
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Minnesota Univ Minneapolis Dept of Psychology
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NAS5-11999
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PB-255 488/9GI 13A PC$7.75/MF$3.00

NSF/RA/T-74/144
Inactivation of Immobilized Fungal Catalase by Hydrogen Peroxide,
PB-252 568/5GI 7C PC$3.50/MF$3.00

NSF/RA/T-75/078
Enzyme Applications in the Vapor Phase and on Electrically Conducting Surfaces.
PB-255 434/3GI 6I PC$4.50/MF$3.00

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NSF/RA-76017
Small Business in the Metals Industry: A Background Study.
PB-255 649/6GI 5C PC$5.00/MF$3.00

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Legislative Priorities for Policy Assistance.
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PB-255 433/5GI 2C PC$4.50/MF$3.00
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PB-255 458/2GI 2B PC$4.00/MF$3.00

NSF/RA-760089
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PB-255 650/4GI 5D PC$9.00/MF$3.00

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Photochemical Conversion of Solar Energy.
PB-255 703/1GI 7E PC$4.00/MF$3.00

NSF-RANN/SE/GI-43895/PR-74-4

Commercial Building Unitary Heat Pump System with Solar Heating.
PB-255 488/9GI 13A PC$7.75/MF$3.00

NSF-76-25

Federal Scientific and Technical Communication Activities: 1975 Progress Report.
PB-253 975/7GI 5B PC$5.00/MF$3.00

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Simplified Solution of the Compressible Subsonic Lifting Surface Problem.
AD-A027 514/9GI 1A PC$4.00/MF$3.00

NSWC/DL-TR-3511

Survey of Software Development Technology at the Naval Surface Weapons Center, Dahlgren Laboratory.
AD-A027 451/4GI 9B PC$3.50/MF$3.00

NTIS/DF-76/002

Los Angeles Reactive Pollutant Program Data - Modelers' Archive. September 1973-November 1973.
PB-255 506/8GI 13B
Mag Tape $100.00;Foreign $122.50

NTIS/DF-76/002A

Los Angeles Reactive Pollutant Program (LARPP) Guide to Modelers' Archive.
PB-255 507/6GI 13B PC$4.50/MF$3.00

NTIS/DF-76/002B

Modelers' Archive for Los Angeles Reactive Pollutant Program (LARPP) Data, Volume I. Operations 1,4,5,6,7,8.
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Monthly Inspection Summary Report.
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Derailment of Amtrak Train on Louisville and Nashville Railroad, Pulaski, Tennessee, October 1, 1975.
PB-254 965/7GI 13L PC$4.00/MF$3.00

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PB-255 651/2GI 13L PC$3.50/MF$3.00

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Collision of a Crown-Trygg Construction Company Truck with an Amtrak Passenger Train, Elmwood, Illinois, November 19, 1975.
PB-254 808/9GI 13L PC$4.00/MF$3.00

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PB-255 663/7GI 18E PC$4.50/MF$3.00

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PB-255 900/3GI 18I PC$3.50/MF$3.00

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Operation of Browns Ferry, Units 1 and 2 Following the March 22, 1975 Fire.
PB-255 198/4GI 18E PC$4.50/MF$3.00

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Light Water Breeder Reactor. Shippingport Atomic Power Station, U.S. Energy Research and Development Administration. Division of Naval Reactors. Project No. 561.
PB-255 662/9GI 18E PC$5.50/MF$3.00

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A Guide for the Licensing of Facility Operators, Including Senior Operators.
PB-255 864/5GI 18E PC$5.50/MF$3.00

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A Synopsis of Studies on the Interaction of Low Frequency Acoustic Signals with the Ocean Bottom.
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Workshop on the Treatment of Decompression Sickness.
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Thermal Discharges to the Ohio River. An Evaluation of River Temperature Relationships, 1964-1974.
PB-255 051/5GI 13B PC$6.75/MF$3.00

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Summary Report of the St. Louis Airport Investigation - Phase II.
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PAT-APPL-479 836/GI
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PATENT-3 938 443 16D Not available NTIS

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PATENT-3 920 616 7C Not available NTIS

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